CLINICAL COACH *for* Nursing Excellence

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CLINICAL COACH

for

Nursing Excellence

Davis's

CLINICAL COACH

Series

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This book is dedicated to the nurses
from our past, present, and future:
shining lamps of nursing knowledge!

Preface

We three faculty members draw inspiration for this resource from our devotion to nursing excellence and our love of teaching today's gifted and motivated nursing students. We also strive to meet the needs of our profession, which is experiencing an acute shortage not only of new graduate bedside nurses but also in progressive career options, including preceptors, charge nurses, advanced practice nurses, and nursing faculty. At the same time, a renewed emphasis on quality patient care—termed Quality and Safety Education for Nurses—calls for RNs to master the knowledge, skills, and attitudes that promote desired outcomes across the continuum of health care delivery (Cronenwett et al., 2007).

Professional nursing organizations have immersed themselves in ways to balance the current nursing shortage with quality patient care. For example, during its annual education summit in 2005, the National League for Nursing identified three critical milestones for the nursing school graduate:

- Passing the NCLEX-RN exam
- Continuing in nursing after the first 2–3 years
- Enjoying a 40+ year career in progressive nursing roles

Clinical Coach for Nursing Excellence provides the keys to accelerate your transition from student through the first two milestones so that you may indeed enjoy the same full and rewarding career in nursing we have experienced. Our motto is:

"We hand you the keys. You accelerate to RN practice."

In fact, we have written this clinical guide and application manual for the following audiences:

- Senior nursing students
- Nursing interns and externs
- Graduate nurses in residencies and other new graduate programs
- RNs through their first 2–3 years of practice

Most textbooks are 3 inches thick, and we use them for learning or reference. This clinical guide "cuts to the chase" to accelerate nursing students' transition to practice. Although this guide offers many features of an application manual, it is *not* an A-to-Z catch-all. Rather, it is a manual of often-used elements that many students find difficult to master. This guide directly helps you to:

- Master key concepts and skills
- Make important connections from evidence to practice

- Stand out in senior nursing practicum
- Pass the NCLEX-RN exam with confidence and ease
- Flourish in your first 2 years of RN practice and beyond

We are pleased to gather previously scattered resources into one clinical guide for you. We predict that *Clinical Coach for Nursing Excellence* will become your favorite, always-in-the-backpack, resource. You will want to delve into this guide as a senior nursing student. You will dog-ear its pages as a nursing intern or extern, as a new graduate, and as an RN in the first couple of years of practice. Designed for regular and repeated use, its features will grab your attention, promote your mastery of critical content, and help you develop problem-solving skills that distinguish you from peers. We encourage you to put your mastery to use as a servant-leader devoted to quality patient care, safety, evidence-based nursing practice, and exemplary interprofessional collaboration.

We have selected and organized content according to our experiences in nursing, education, and business. Our overarching desire, or philosophy, is to promote **professional pride**, partly in reaction to the surprising invisibility of our profession (Buresh & Gordon, 2006). We believe that nursing's visibility and value will follow naturally from increased pride. We then use a map, Benner's 1984 theory of skill acquisition (Benner, 2001), to guide the way. Benner provides the path, and we contribute the vehicle from time-tested assertions. Some of these assertions have endured for years; others come from cutting-edge literature. All of these assertions resonate with professional pride:

- "Begin with the end in mind" (Covey, 1989, p. 95)
- Pursue consciously competent practice (Benner, 2001)
- Improve "patient care and the work environment through support of evidence-based practice" (Goode, 2000, p. 222)
- Say *yes* to wow!" (Peters, 1997, p. 309) to accelerate reflective journaling

We view our efforts as a way to express ourselves as "super-mentors." Russo (2007) describes a super-mentor as "a selfless soul who is an expert teacher, life coach and networker-extraordinaire all wrapped into one" and asserts that "becoming a super-mentor is as worthy an aspiration as, say, curing cancer, understanding an ecosystem or identifying the stuff that makes up the Universe" (p. 881). We strive to have you regard us as your super-mentors to address intensely felt difficulties in making the transition from nursing student to practicing RN. We would love to hear from you as your exciting future in nursing unfolds!

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CHAPTER 1

Providing a Framework to Accelerate Your Transition to Practicing RN

Welcome to *Clinical Coach for Nursing Excellence.* We wrote this clinical guide to accelerate your transition to becoming a practicing RN. In fact, if you read the preface, you know our motto: "We hand you the keys. You accelerate to RN practice."

This guide promotes consciously competent nursing practice by identifying potential difficulties for you *before* you enter the nursing workforce and elevating your confidence *after* you graduate. As you learned in nursing school, cutting-edge RN practice depends on philosophy, theory, nursing process, and best evidence. You already have the philosophy and desire to become a registered nurse; we provide a nursing theory or map by which you can track your progress "from novice to expert." We revisit the nursing process because it comprises the first six American Nurses Association (ANA) standards of professional practice. We have also researched the best evidence or practice elements that many students and newer nurses find difficult to master. Six of these difficulties are listed in Box 1–1.

In this first chapter we present foundational content designed to make clinical content in chapters 2 through 10 more understandable and memorable. We selected this content not only from our own experiences as nurses and faculty but also from contributions of high-profile leaders in nursing and business. Chief among them are:

- Patricia Benner, PhD, RN, FAAN, whose 1984 model of skill acquisition has become a well-accepted theory of nursing students' consistently observed progression "from novice to expert."

Box 1–1 Why Is *Clinical Coach for Nursing Excellence* Important?

Casey and colleagues surveyed 270 new graduate RNs to gauge graduate nurses' experiences. Analysis of responses to open-ended questions revealed six themes, cited here in order of frequency and intensity of difficulty in making the transition from student to RN:

1. Lack of confidence in skill performance; deficits in critical thinking and clinical knowledge
2. Relationships with peers and preceptors
3. Struggles with dependence on others, yet wanting to be independent practitioners
4. Frustrations with the work environment
5. Organization and priority-setting skills
6. Communication with physicians

Adapted from Casey, Fink, Krugman, & Propst, 2004, p. 307.

- Linda Cronenwett, PhD, RN, FAAN, Dean at the School of Nursing, University of North Carolina at Chapel Hill, and her colleagues, whose 2007 article on "Quality and Safety Education for Nurses" conveys much of what it means to be a competent and respected nurse. This initiative has already become popularly known as QSEN (pronounced kew-sen) and boasts a cutting-edge Web site of resources at www.qsen.org
- Colleen Goode, PhD, RN, FAAN, whose presentations and publications document her own evolution from research utilization to evidence-based practice (EBP) in nursing.
- Stephen R. Covey, MBA, DRE, whose publications and presentations in principle-centered leadership have achieved international renown. His phrase, "Begin with the end in mind," will serve your entire career, and his depiction of pursuits in a quadrant model inspired our own Coach Quadrants, which are discussed later in this chapter.
- James C. Collins, MBA, who with Stanford business professor Jerry I. Porras wrote *Built to Last: Successful Habits of Visionary Companies*. They coined the phrase, "Embrace the genius of the *and*," which we do throughout this guide, such as by presenting nursing *and* business tools. We explain this concept more fully in the following section titled "You and *Clinical Coach for Nursing Excellence*."

- Tom Peters, MBA, PhD, who wrote *The Circle of Innovation* and coined the phrase, "Say *yes* to WOW!" We hope you say *yes* to WOW throughout your nursing career!

You and *Clinical Coach for Nursing Excellence*

You may feel at least as nervous about launching your career in nursing as you did when you first got behind the steering wheel of a car. You may wonder how you will fare as a new graduate nurse, especially when many of your concerns appear among the daunting list of transitional difficulties presented in the box, "Why Is *Clinical Coach for Nursing Excellence* Important?" The answer is easy: immerse yourself in this guide, and consider us your personal coaches.

Coaches take pride in helping charges face reality, and wise coaches do not permit wallowing in gut-wrenching words like *lack, deficit, struggle,* and *frustration*. Instead, you will learn to apply the "genius of the *and*," a theme that emerged from a Stanford study of outstanding businesses. The "genius of the *and*" acknowledges the reality of simultaneous driving and restraining forces. For example, improved outcomes in health-care delivery have resulted from driving forces, such as a national surge in nurse-managed clinics to increase accessibility, availability, and affordability of primary health care. At the same time, advanced practice nurses in these clinics have offered restraining forces related to overuse of the health-care system through their emphasis on anticipatory guidance, health promotion, and disease prevention strategies.

The "genius of the *and*" also honors the ability to cope with these simultaneous forces and counters a tendency to view potential outcomes as all or nothing, either/or, or only positive or negative. In reality, you will experience frustration *and* triumph. You may focus on struggles, however, because advances occur sporadically enough that you fail to notice them. For example, you may depend on a preceptor for challenging medical orders like "pan culture" even while you are achieving independence in equally daunting areas such as shift organization. You will notice progress more often if you consciously engage in reflective professional practice, which is the ability to look back in order to look forward with more clarity and discernment. Try these strategies:

- **Set aside time to think.** Aim for 15–20 minutes every day. By adding time for reflection to the usual quick thinking required in the nursing role, you may avoid the "all or nothing" trap that often accompanies more impulsive reactions. This time in

reflection is particularly helpful if you catch yourself saying "yes" when you mean "no."

- **Identify three or more alternatives to a dilemma.** This strategy prevents either/or thinking.
- **Think more objectively about issues by setting up a pro-and-con table.** This action disrupts seeing situations as completely positive or negative.
- **Ask yourself questions that incorporate changes and transitions you want for the future:** "What do I know now that can help me when I get off orientation?"
- **Take pride in the active listening skills and powers of observation you are developing in your nursing role.**

The "genius of the *and*" extends to the powerful emotions you may feel as a nurse. For example, it is undeniably sad when a patient dies, and many nurses wonder how they can have pleasant emotions at the same time. In fact, nurses often grapple with extended periods of sadness, especially if they intensify sad occurrences by experiencing them as "horrible" or "devastating." We encourage you to resist such magnifications and to attempt to feel less sad until you are calm. The following actions support this mature and self-nurturing approach:

- Consider that the opposite of "sad" is *not* "happy." The opposite of "sad" is "not sad." Happiness is on a different continuum of joyful emotions. As a result, happiness can coexist with less enjoyable emotions when you appreciate the "genius of the *and*."
- Insist on debriefing with preceptors or peers after a sad outcome, as you did during nursing school classes or post-clinical conferences. Experienced nurses appear callous when they dismiss newer nurses' need to debrief a patient's death. In truth, they may have acquired the ability to feel less sad but are unable to articulate this coping mechanism. You may have to remind them of the need to process patients' deaths.
- Set a timer for 30 minutes, and allow yourself to feel sad until the buzzer sounds. Each subsequent day, set the timer for 1 minute less. As the end of 1 month approaches, most nurses have unburdened their sadness and indeed feel calm. If this strategy does not relieve your sorrow, contact your employee assistance program for additional help.

Clinical Coach for Nursing Excellence also accelerates your transition to becoming a practicing RN through its features, such as various margin notes and clinical exemplars. In addition, PEAK Performance boxes identify

relevant strategies that promote the **P**urpose, **E**vidence, **A**ction, and **K**nowledge nursing students and RNs need to achieve desired outcomes for patients. Throughout this guide we coach in the following ways:

- Explaining concepts, roles, and actions that are difficult to master.
- Illustrating pattern recognition of "consciously competent" thoughts, words, deeds, and habits.
- Guiding your practice of critical skills.
- Inspiring you to envision yourself in safe, competent practice—well beyond your starting point as a nursing student.

Our former students tell us that a particularly helpful tip was to anticipate themselves a year into safe, competent practice while they were still students. As a result, they had the energy, will, and emotional stability needed to persevere through every milestone along the way:

- Taking final examinations
- Preparing for and taking the NCLEX-RN test (including waiting for results)
- Hunting and interviewing for new graduate RN positions
- Engaging in new employee and unit orientations
- Succeeding in autonomous and collaborative practice

Alumni surveys revealed that our former students outshone other new graduates. They completed orientations sooner, had more respectful interactions with peers and preceptors, and advanced to float nurse and preceptor roles less than 1 year into RN practice. A favorite comment from a community agency was, "We don't interview your graduates. We hire them."

PEAK Performance Key No. 1: Philosophy and Theory of RN Practice

Our first key is to explain hard-to-understand foundational concepts. We seek to increase your understanding of the underlying purpose, evidence, action, and/or knowledge related to RN practice. We begin by translating abstract words like *philosophy* and *theory* into everyday language that you can remember and embrace:

- **Philosophy = Desire:** Our greatest desire for you is to take and show pride in professional nursing.
- **Theory = Map:** We use Benner's 1984 Model of Skill Acquisition (Benner, 2001), presented in PEAK Performance Key No. 2 in more detail.

Once you have a map, you can confidently select your path, which serves as a framework for professional nursing practice. Members of the

national faculty for Quality and Safety Education for Nurses recommend these six elements for any path in nursing (Cronenwett et al., 2007):

1. Patient-centered care, where the patient (or designee) is a co-partner with the health-care team.
2. Teamwork and collaboration, which takes place within nursing and interprofessional teams.
3. EBP, which integrates clinical expertise, best evidence, and patient preferences for delivery of optimal health care. (See the list of non-research evidence in Performance Key No. 4.)
4. Quality improvement, which uses data to monitor and continuously improve health-care systems.
5. Safety, which minimizes risk of harm to patients and providers.
6. Informatics, which uses information and technology in all aspects of care, including clinical decision making.

As your coaches we add three more elements in order to create a comprehensive framework that supports professional nursing pride:

1. Spectral thinking, which specifies ways of thinking to obtain a more complete picture of any clinical puzzle or problem (see PEAK Performance Box).
2. Reflective journaling, which enhances and documents your thinking and changes your role in the framework from recipient of learning to active participant.
3. Energy management, which underlies your ability to meet the demands of your framework *and* personal life.

PEAK Performance Key No. 2: Clinical Progression From Novice to Expert

We chose Benner's Model of Skill Acquisition (Fig. 1–1) not only as another articulation of "begin with the end in mind" but also as a map. Its theoretical

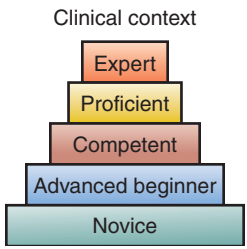


FIGURE 1-1: Benner's model of novice to expert.

PEAK PERFORMANCE: SPECTRAL THINKING

At a talk in Denver in 2004, international nursing leader Daniel Pesut, PhD, RN, FAAN, cited six ways of thinking, which taken together constitute spectral, or comprehensive, thinking:

1. Critical thinking, which nursing students know well as quality of thought. The Foundation for Critical Thinking (www.criticalthinking.org) defines critical thinking with a list of universal intellectual standards: clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness.
2. Creative thinking, which considers alternative solutions, including another's, sometimes opposite, point of view. Nurses' inclination toward empathy facilitates the desired creativity.
3. Reflective thinking, which comes from engaging in self-talk. A mirror may promote authentic reflective thinking. When you talk to yourself in a mirror, you can catch nonverbal expressions, such as flinching, frowning, or smiling, that will help you better analyze and evaluate something that has happened.
4. System thinking, which considers the possibility of behind-the-scenes elements or unquestioned structures. For example, you notice that patient transfers go smoothly between only one intensive care unit (ICU) and step-down unit, and you wonder why. You learn their charge nurses meet for breakfast once a month to maintain goodwill and collaborative relationships. To accelerate your ability to acquire system thinking, challenge the unconscious reply, "Because that's how we've always done it."
5. Network thinking, which acknowledges and attempts to respond to complexity in the health-care delivery system. To enhance network thinking while beginning as a nursing student, notice situations that demand an urgent response. Note how often they occur and what resources are required to address crises.
6. Predictive thinking, which searches for patterns by using an "if/then" approach. For example, "If I arrive for my shift 20 minutes early, then I can find a shift buddy." A shift buddy is a valued peer who willingly shares nursing responsibilities, such as turning and bathing patients.

progression "From Novice to Expert" will help you envision and track your development in professional nursing.

Novice and Advanced Beginner

According to Benner (2001), nursing students perform as novices. Two factors characterize the novice stage:

1. Dependence on rules: to counter their lack of experience.
2. Frustration: when a rule applies in one situation but not in another.

Senior nursing students must transition from novice to advanced beginner to meet universal expectations for safe practice as new graduate nurses. This stage depends on two factors:

1. Real-life clinical experiences.
2. Recognition of recurrent and meaningful patterns.

You will notice achievement of this step to advanced beginner when you no longer need to ask a preceptor for "the rule" about an element of nursing practice. Instead, you will use principles to guide your actions and anticipate exceptions to rules based on unit-specific clinical experiences. For example, RNs working in a multi-specialty surgical ICU had a "rule" to use soft restraints on intubated patients' wrists to prevent premature extubation. Application of the rule, however, had exceptions based on the principle that the use of restraints was to promote patient safety.

A woman with Marfan syndrome was one such exception. She had received a new heart valve by means of open heart surgery. She remained intubated and ventilated for several days postoperatively but was fully awake and aware. In establishing a care plan, the primary RN and patient negotiated the use of soft restraints only during sleep. When the patient was awake, her wrists remained untied to allow written communication. This 38-year-old woman had a lot to say! She wrote about her syndrome, numerous surgeries, quality of life, and hopes for the future. In fact, she filled a yellow legal pad during her stay and was grateful for RNs who not only engaged in meaningful "conversation" with her but also allowed her to express herself as fully as possible during her intubation.

To accelerate your transition from novice to advanced beginner:

- Anticipate orders based on similar assessments, and document new knowledge in your clinical log or journal.
- Discuss surprises with your preceptor.
- Track the amount of time in your care plans you spend performing interventions. Your confidence will soar, for example, when you can obtain pan cultures in 40 minutes instead of 1 hour. In time, you may need less than 20 minutes.

ALERT

Lapses in sterile technique require immediate remediation. A breach in sterile technique is a critical violation of patient safety.

In addition to developing a principle-driven approach to nursing care, advanced beginners also must demonstrate mastery of critical clinical skills. Your nursing program no doubt provided you with a multipage checklist of every conceivable psychomotor skill, which you updated during skills and simulation laboratories and clinical rotations. This kind of comprehensive checklist does not identify

the "must have" skills that promote confidence in senior nursing students, their patients, and their preceptors. Box 1–2 lists essential skills and groups them according to the steps of the nursing process.

Box 1–2 Essential Skills for the Generalist RN

The following skills are grouped according to general nursing skills and the nursing process. These are considered basic skills that a generalist nurse should be comfortable performing after completing nursing school.

1. General
   - Body mechanics
   - Bed making
   - Code (COR) response
   - Disaster response
   - Isolation precautions
   - Nursing documentation
   - Perioperative care (preoperative/postoperative)
   - Post-mortem care
   - Principles of infection control (hand washing, levels of precautions)
   - Sterile technique
2. Assessment
   - Basic "head to toe" physical assessment
   - Health history interviewing
   - Newborn assessment
   - Pain assessment
   - Postpartum assessment
   - Vital signs, pulse oximetry, height and weight
   - Epidural assessment
   - Intake and output (I&O)
   - Wound/incision assessment
3. Diagnosis
   - Capillary blood glucose measurement
   - Specimen collection (blood, nasal swab, sputum, stool, throat swab, urine)
4. Outcomes Identification and Plan
   - Antiembolism procedures
   - Chronic pain management
   - Client/environment safety
   - Pressure ulcer prevention
   - Client's activities of daily living (ADLs), mobility, fall risk
   - Medication calculation
   - Nutrition and elimination procedures
   - Patient-controlled analgesia (PCA) pump
   - Subcutaneous (SC) drug administration site rotation

Continued

Box 1–2 Essential Skills for the Generalist RN—cont'd

5. Interventions
   - Bladder irrigation
   - Blood administration
   - Central venous access device monitoring and dressing change
   - Chest tube maintenance
   - Client hygiene, skin care
   - Client positioning, transfers, and range of motion
   - Drain monitoring (Jackson-Pratt, Hemovac, Penrose, T-tube)
   - Enteral feeding/medication administration
   - Enterostomal care
   - Insulin preparation and injection
   - Medication administration (topical, oral, inhaled, IM, SC, PV, PR)
   - IV medication (IV push)
   - IV therapy (continuous)/monitoring: maintenance
   - IV therapy (intermittent): piggybacks
   - Nasogastric tube (NGT) insertion and maintenance
   - Oxygen delivery systems
   - Pain management
   - Physical restraints
   - Seizure precautions
   - Suture, staple, and clip removal
   - Sequential compression stockings/thromboembolic disease (TED) hose
   - Total parenteral nutrition (TPN) administration
   - Tracheostomy care and suctioning
   - Urinary catheter insertion
   - Wound care
6. Evaluation
   - Diagnostic (laboratory) monitoring
   - Medication response
   - Telemetry and cardiac dysrhythmia identification
   - TPN maintenance/monitoring
   - Urinary catheter maintenance/monitoring

What steps can you take if you lack mastery in these essential skills?

- Request a review session with your preceptor, who will appreciate your initiative in addressing any gaps in basic nursing skills. Many clinical agencies have a skills laboratory where you can practice basic skills.
- Book time with clinical faculty in your school's skills or simulation laboratory.

- Check out audiovisual resources from your school's learning laboratory or library.
- Volunteer for community service at a health fair to improve several basic skills in a less acute environment.
- Review related policies and procedures with a peer during clinical rotations. Challenge each other to pursue mastery.
- Volunteer to assist at skills laboratories. When you take responsibility for teaching a skill, your motivation to master it will increase.

COACH CONSULT

Do not underestimate the impact of doing well in every course and every clinical rotation, even those areas where you cannot imagine working. You will gain critical clinical experience to accelerate your transition to becoming a practicing RN, opportunities to "work smarter, not harder" in preparation for the NCLEX-RN examination, a fair-game test of broad nursing knowledge across the life span, and the broad clinical base required for future roles in leadership and education.

Competence

Competence, the next level in Benner's model, develops when you see your actions in terms of consciously devised long-range goals. For the competent nurse, a plan establishes a desired perspective and derives from considerable contemplation of the problem at hand. The deliberate planning that is characteristic of this skill level helps you achieve efficiency and organization. An unconsciously competent nurse may lack the speed and flexibility of a proficient nurse but does have a feeling of mastery.

The Coach Quadrant (Fig. 1–2) explains our notion of *conscious competence*.

- The upper right box is the ideal. CC stands for consciously competent. You're good, and you know why you're good. You humbly

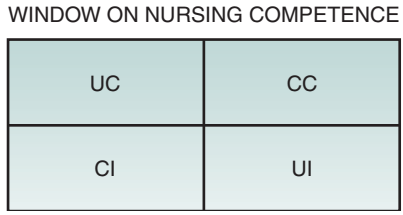


FIGURE 1-2: Conscious Competence. CC = consciously competent. UC = unconsciously competent. CI = consciously incompetent. UI = unconsciously incompetent.

accept the praise that consistently comes your way because of your conscious efforts.

- The upper left box, UC, stands for unconsciously competent. You may be good, but you do not know why. Your knowledge of pathophysiology, especially, is weak.
- The lower left box, CI, stands for consciously incompetent. Few nurses exhibit the laziness that typically accompanies this approach. Most often, these individuals are in the wrong profession.
- The lower right box, UI, stands for unconsciously incompetent. Even fewer nurses are apathetic. Most often, these individuals manage their own energy so poorly that they have little to offer in health care.

Another critical point is that yesterday's protocols sometimes become tomorrow's errors, such as shaving every preoperative patient. Razor nicks became a portal for infection, which halted this nearly universal practice. Broad capabilities, such as knowing how to search for relevant literature, must accompany protocols to have a "consciously competent" approach to EBP.

Valid research also promotes consciously competent nursing practice. Nursing students typically locate and review current research findings to fulfill academic requirements. New graduates can accelerate their status from advanced beginners to consciously competent RNs by reviewing research literature when faced with compelling questions and unsolved problems.

Another aspect of conscious competence is the ability to articulate a definition of nursing. At a time when many colleagues define nursing as *caring,* we prefer to define nursing more broadly, as *stewardship of holistic human health and healing*. *Stewardship* encompasses these findings from Swanson's classic 1990 study of nursing care provision, which includes not only *caring* but also other value-laden attributes that communicate nursing's domain more fully:

- Caring
- Attaching (or performing acts of love)
- Managing resources and responsibilities
- Avoiding bad outcomes

Consider the following scenario about a patient in a neurosurgical ICU. We direct your attention to the nurse's stewardship of holistic human health and healing on behalf of the patient and his wife.

CLINICAL VOICE: NURSING AS STEWARDSHIP OF HOLISTIC HUMAN HEALTH AND HEALING

Two ambulances transported the Conway family to a community hospital minutes after a horrific drunk-driving accident. Mr. and Mrs. Conway and their two school-age children had been enjoying an autumn afternoon in a horse-drawn carriage when an intoxicated driver in a large sedan hit them head on. The impact killed the horse and driver and launched the family out of the carriage to the ground. The son landed on his father, which cushioned the son from serious injury. The daughter sustained survivable injuries, including a broken arm. Only Mrs. Conway, who landed in a grassy culvert, escaped injury. The critical nature of her husband's injuries became apparent when he remained unresponsive on the pavement.

Emergency department personnel recognized signs and symptoms of a basilar skull fracture and transported Mr. Conway to a university hospital. Neurosurgeons performed a craniotomy and evacuated a blood clot. Brain swelling, however, remained diffuse. They placed a device to monitor Mr. Conway's intracranial pressure (ICP) and transferred him to the surgical ICU. Despite diligent, state-of-the-art efforts, days passed, and he did not regain consciousness.

A nurse who cared for Mr. Conway three nights in a row noticed that his exhausted wife kept her eyes glued to the monitor. The nurse put her hands on Mrs. Conway's shoulders. With quiet determination Mrs. Conway looked up and said, "I know the prognosis is grim, but is there anything I could be doing?" The nurse told her about some recent research that found stroking the cheek lowered ICP, a term Mrs. Conway had come to know only too well. Mrs. Conway turned away from the monitor to her husband and began stroking his cheek. To her amazement, when she looked back at the monitor, his ICP had dropped several millimeters of mercury (mm Hg).

Although this husband and father soon died from his brain injuries, Mrs. Conway later said that she began to heal when she participated in his care in a meaningful way. She also regained energy to attend to and comfort their children. The Conways had a sad outcome, but they could recall some positive aspects of their ordeal arising from nursing stewardship.

The Proficient and Expert Nurse

Benner describes two more stages in the progression from novice: proficient and expert. Although acquisition of these stages is several years away, the terms are worth understanding from the beginning of your career. Desiring these stages and creating a map to acquire them may actually speed your progression to them.

Proficient nurses consider long-term goals from the beginning, which enables them to perceive situations as wholes rather than as chopped-up parts. Proficient nurses also articulate and follow principles; they recognize when an expected scenario does not materialize. This holistic understanding not only improves proficient nurses' decision making but also commonly makes them excellent preceptors. This additional role, in turn, accelerates their acquisition of the expert stage.

Expert nurses no longer pause to consider a principle to connect their understanding of a situation to an appropriate action. Expert nurses draw on their depth and breadth of experience to recognize a problem without wasteful consideration of alternative diagnoses and solutions. This recognition of patterns permits expert nurses to grasp unfamiliar territory quickly and to use their repertoire of problem-solving skills to act decisively on behalf of desired outcomes.

PEAK Performance Key No. 3: Nursing Process

In addition to articulations of your philosophy and theory for RN practice, professional nursing pride also rests on the familiar nursing process. We revisit its six components because they provide a checkpoint to know your focus at any given moment. Although many nursing professionals pride themselves on being able to "multitask," in truth, frenzied activity is the enemy of excellence. Fewer errors occur when nurses address their patients' needs according to principles of assessment and priority diagnoses, such as Impaired Airway Clearance.

Many nursing students, even as seniors, do not know that the steps of the nursing process constitute the six practice standards of the ANA (2003). ANA leaders recently added Standard Three: "Outcomes Identification" to reflect an emphasis on achievement of desired outcomes. We value this standard for its consistency with the foundational concept coined by business guru Stephen Covey, "begin with the end in mind." The steps of the nursing process occur in a continuous feedback loop, as

PEAK PERFORMANCE: ADOPIE

Use the acronym ADOPIE (Assessment, Diagnosis, Outcomes Identification, Planning, Implementation/Intervention, and Evaluation) to promote instant recall of these critical standards of the nursing process. When your approach is systematic, you increase your ability to recognize patterns, both expected and unexpected.

depicted in Figure 1–3, and the associated PEAK Performance Box offers a mnemonic to help you commit these steps to memory.

PEAK Performance Key No. 4: Best Evidence for Nursing Practice

One aspect of consciously competent practice deserves its own section. Best evidence for nursing practice derives from a cutting-edge approach, generically known as evidence-based practice (EBP). This approach received endorsements from the Institute of Medicine, Joint Commission, American Association of Colleges of Nursing, and nursing's QSEN Initiative. Although nursing literature promotes an explicit emphasis on evidence-based *nursing* practice, Bernadette Melnyk, a nationally known expert on the topic, reports two interrelated limitations:

1. A sustained research trajectory is required to produce rigorously obtained research findings that are compelling enough to alter nursing practice.
2. On average, 17 years are required to disrupt the status quo to put research findings into practice.

Meta-analyses, or reviews of multiple studies, and randomized controlled clinical trials produce the highest levels of research evidence in support of best practice. Unfortunately, only about 20% of all medical protocols have received this level of rigorous testing and scrutiny. As a result, insufficient research is a common problem in nursing and every other health-care discipline. In 2000, Colleen Goode, another nationally recognized expert on

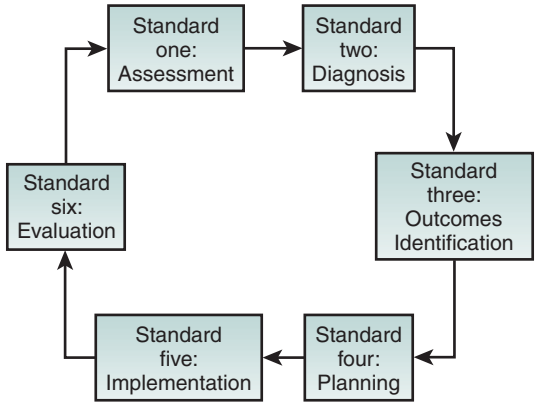


FIGURE 1-3: Depiction of the nursing process.

evidence-based nursing practice, proposed consideration of nine sources of non-research evidence:

1. Bench-marking data, which identify best practices and include appropriate rates of use for procedures, preventive care data, and disease management protocols.
2. Cost-effectiveness analysis, which compares anticipated benefits with risks and costs.
3. Pathophysiology, which provides the basis for clinical decision making, particularly about the impact of interventions.
4. Retrospective or concurrent chart review, which assesses standards of documentation and quality care. Review of individual records provides evidence for many specific patient care decisions, based on known allergies, family history, advanced directives, and similar personal data.
5. Quality improvement and risk data, which offer evidence to evaluate and correct specific problems, such as medication errors and skin breakdown.
6. International, national, and local standards, which government and specialty organizations produce to guide practice.
7. Infection control, which applies institutional data to evaluate community-acquired and nosocomial infections, especially when compared with national rates to detect outbreaks.
8. Patient preferences, which contribute to patients acting as full partners in their care. These preferences typically stem from religious or cultural beliefs. Nurses play a key role in advocating for patient preferences to prevail.
9. Clinical expertise, which depends on providers' capabilities and decision-making skill as developed in formal education and through professional experience.

This clinical guide and application manual brings you the best evidence from pathophysiology and clinical expertise. Our guidance in assessment, diagnostics, patient care, communication, nursing actions, and ethics will assist you in maintaining a balance between cost-effectiveness and protocols while simultaneously giving precedence to patient preferences. We encourage you to join your organization's journal club, or start one if necessary. You will begin a lifelong immersion in the research process and develop an appreciation for how your organization obtains and applies non-research forms of evidence.

Chapter Summary

Chapter 1 introduced you to this book. We provided ways and means to use this guide and developed four foundational PEAK Performance Keys:

- Key No. 1: Philosophy and Theory of RN Practice
- Key No. 2: Clinical Progression From Novice to Expert
- Key No. 3: Nursing Process
- Key No. 4: Best Evidence for Nursing Practice

We included features to increase your grasp of the realities of today's nursing profession and presented bonus material to instill professional pride for your value in enduring service across the continuum of healthcare delivery.

Chapter 2 gathers road-tested resources from multiple sections of our summer nursing externship and senior nursing practicum. This content will help you to articulate interrelated knowledge from pathophysiology and pharmacology, which will further accelerate your conscious competence. Chapter 2 also presents the emerging technique of Dimensional Analysis for Drug Calculations. This approach works regardless of the type of calculation you must perform. We hope you are turning to Chapter 2 right now!

CHAPTER 2

Pathophysiology and Pharmacology: Making Connections and Mastering Dosage Calculations

This chapter gathers road-tested resources from multiple sections of our summer nursing externship and senior nursing practicum. This content not only helps you articulate interrelated knowledge from pathophysiology and pharmacology for common diseases but also helps you make these connections with other diagnoses. Linking pathophysiology with pharmacology in every work setting will accelerate your conscious competence, especially in the realms of patient safety and desired outcomes.

First, we feature some prevalent disease processes that occur across the life span:

- Heart failure
- Asthma and chronic obstructive pulmonary disease (COPD)
- Gastroesophageal reflux disease (GERD) and peptic ulcer disease (PUD)
- Diabetes mellitus (DM) (types 1 and 2)
- Glaucoma
- Preeclampsia

For each disease process, we review the pathophysiology, signs and symptoms (S/S), and major drug classes. Where applicable, we note other

drugs used to treat comorbidities. We also provide margin notes, clinical alerts, summaries, and other series features to make these topics understandable and memorable.

Near the end of the chapter, we present Dimensional Analysis (DA), which we recommend for making dosage calculations due to its universal application regardless of route. DA simplifies medication administration and increases patient safety.

Heart Failure

Heart failure is a progressive, often fatal, disorder of the heart's pumping chambers. It includes several types of cardiac dysfunction resulting in lack of tissue perfusion. The most common cause of heart failure relates to dysfunction of the left ventricle (systolic and diastolic heart failure). Heart failure also may occur in conjunction with pulmonary disease (right heart failure) or in conditions of normal or elevated cardiac output and poor tissue perfusion (high-output failure). Risk factors associated with various types of heart failure include those that are modifiable with lifestyle changes and those that are unavoidable, such as old age:

- Untreated hypertension (HTN)
- Smoking
- Alcohol abuse
- Obesity
- Coronary artery disease (CAD)
- Acute myocardial infarction (AMI)
- Heart valve disease
- Dysrhythmias
- Side effects of chemotherapy drugs
- Cocaine abuse
- Advancing age

An important process related to myocardial dysfunction in systolic, diastolic, and even right heart failure is the pathophysiological remodeling of the left ventricle. This remodeling occurs with longstanding myocardial dysfunction due to a myocardial infarct (MI), ischemic heart disease (IHD), CAD, HTN, heart valve disease, dysrhythmias, and/or an aging heart. Figure 2–1 illustrates the cyclical nature of heart failure. Figure 2–2 shows the pathophysiology of heart failure.

Improve your understanding of heart failure through visualization of related pathophysiology. Picture the action of myocytes, brain natriuretic peptides (BNPs), and other compensatory mechanisms described in the following paragraphs.

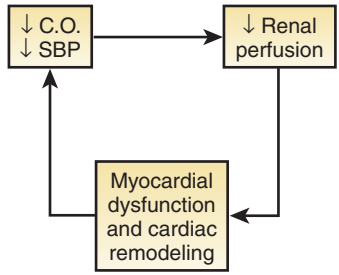


FIGURE 2-1: Cyclical nature of heart failure.

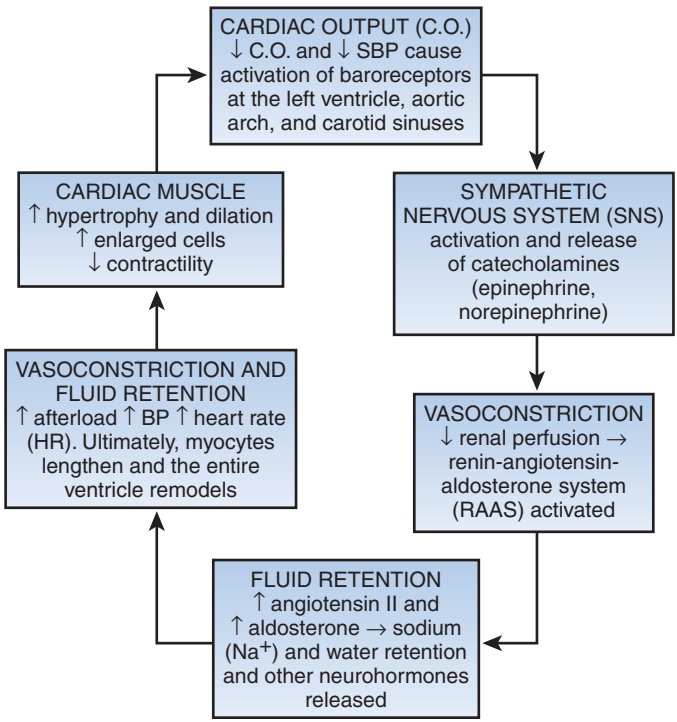


FIGURE 2-2: Pathophysiology of heart failure.

Myocytes lengthen to receive increased blood volume, due to sodium and water retention, and to increase the contractile force of the heart as heart rate (HR) decreases. The walls of the heart become thicker in a concentric direction rather than in a spherical or cylindrical direction, which causes the heart to look more like a softball than a football. For a while, this process alone compensates and maintains cardiac output. Over time, increased wall stress results in an increased need for oxygen, and decreased left ventricular ejection fraction (LVEF) results in a decrease in cardiac output.

In addition, various peptides found in the brain, atria, and heart tissues assist the body in its regulation of fluid balance and blood pressure (BP). The heart's ventricles release B-type peptides, or BNPs, in response to an increase in the heart's ventricular pressure and end-diastolic volume. As a result, BNP is a relatively easy way to measure for heart failure:

- Normal value: < 100 pg/mL
- Indicator of heart failure: > 400 pg/mL

In any event, compensatory mechanisms try to maintain cardiac output. HR increases due to decreased ventricular filling. BP increases due to decreased cardiac output. Other compensatory mechanisms and sequelae include those noted in Figure 2–3. Box 2–1 explains the characteristic S/S of heart failure.

Pharmacology and Heart Failure

Patients may be required to take several different classes of medications to manage their heart failure (Table 2–1). They often ask if they can stop any of the drugs. It is important to know a patient's prescribed medications and how they work to confirm the patient's need to continue medications as prescribed. For example, patients may take a diuretic, beta blocker, angiotensin-converting enzyme (ACE) inhibitor, spironolactone (potassium-sparing diuretic), and digoxin. They may also take a baby aspirin or other antiplatelet drug as well as medications to lower their cholesterol, such as HMG CoA reductase inhibitor or statin, fibrates, niacin, bile acid sequestrants, ezetimibe, and plant sterols (Box 2–2). Drug classes to know include:

- ACE inhibitors (act like vasodilator and diuretic): decrease preload and afterload, increase cardiac output and blood to kidneys
- Diuretics (not potassium-sparing): decrease blood volume, BP, venous pressure, pulmonary edema, peripheral edema, cardiac dilation
- Beta blockers: with cautious use decrease heart contractility to decrease O_2 demands, improve exercise tolerance, increase LVEF, and slow remodeling

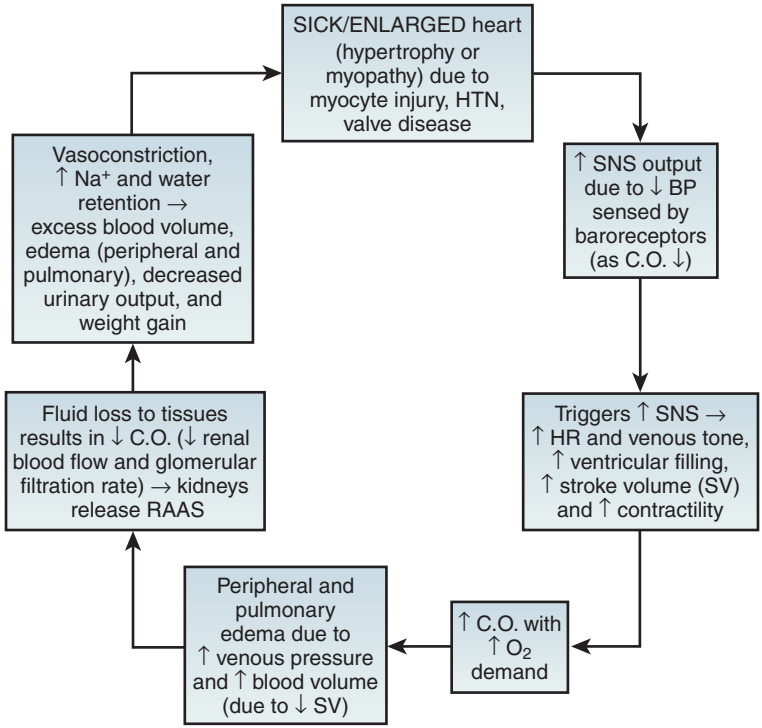


FIGURE 2-3: Compensatory mechanisms and sequelae in heart failure.

Box 2–1 Heart Failure Signs and Symptoms

Know the characteristic signs and symptoms (S/S) for the various types of heart failure.

1. S/S *systolic* left heart failure: ventricles cannot fully contract; caused by AMI, uncontrolled HTN, cardiomyopathy, or valve abnormalities
   - Exercise intolerance
   - Fatigue
   - Shortness of breath (SOB), dyspnea, paroxysmal nocturnal dyspnea (PND), orthopnea, tachypnea, cough
   - Tachycardia with increased or decreased BP
   - Cardiomegaly, S3 gallop, CAD; low ejection fraction (EF <55%)
   - Pulmonary edema (cyanosis, basilar crackles, pleural effusions)

Continued

Box 2–1 Heart Failure Signs and Symptoms—cont'd

- Peripheral edema
- Hepatomegaly, swollen abdomen
- Distended jugular veins
- Weight gain
- Decreased urinary output, nocturia

2. S/S *diastolic* left heart failure: ventricles cannot fully relax
   - Fatigue
   - Dyspnea on exertion
   - PND
   - Orthopnea
   - Tachypnea
   - Cough
   - Hemoptysis
   - Basilar crackles
   - Pulmonary edema
   - Pleural effusion
   - Normal EF (55% or more of the ventricular blood volume is ejected with each pump or heart beat)
3. S/S *right* heart failure: caused by left-sided heart failure or cor pulmonale; therefore, you may note S/S similar to left-sided heart failure and also the following:
   - Peripheral edema
   - Hepatomegaly, swollen abdomen
   - Abdominal pain, ascites
   - Anorexia, nausea, bloating, constipation
   - Distended jugular veins
   - Weight gain

- Inotropic agents (digoxin): increase ventricular contraction, provide more complete ventricle emptying, and increase cardiac output, which decreases compensatory mechanisms such as increased HR and increased renin release
- Spironolactone or eplerenone: aldosterone receptor blocker

Desired Outcomes for Patients With Heart Failure

Increase your overall understanding of heart failure with our PEAK mnemonic to summarize nursing process, use best evidence, and promote the following desired outcomes:

- Assist patients to develop a realistic activity program that balances exercise and activities with energy-conserving actions.

Table 2–1 Drug Classes for the Treatment of Heart Failure

CLASS	MECHANISM OF ACTION (MOA)/INDICATION	ADVERSE EFFECTS
ACE Inhibitors Benazepril (Lotensin) Captopril (Capoten) Enalapril (Vasotec) Fosinopril (Monopril) Lisinopril (Zestril) Quinapril (Accupril) Ramipril (Altace) Trandolapril (Mavik)	Block production of angiotension II in the renin-angiotensin-aldosterone system Vasodilate arterioles and veins Decrease release of aldosterone	Hypotension, hyperkalemia, cough, angioedema, fetal harm
Diuretics Thiazide (Hydrochlorothiazide) Loop furosemide (Lasix) Potassium-sparing spironolactone (Aldactone)	Decrease blood volume Decrease venous pressure Decrease afterload Decrease pulmonary edema, peripheral edema, cardiac muscle dilation	
Beta Blockers Acebutolol (Sectral) Atenolol (Tenormin) Bisoprolol (Zebeta)* Carvedilol (Coreg) Labetalol (Trandate) Metoprolol (Lopressor, Toprol XL)* Propranolol (Inderal) Timolol (Blocadren)* *Cardioselective drugs used	Decrease contractility Decrease O_2 demand on heart Decrease cardiac output Decrease LVEF Slow progression of remodeling Stop development of dysrhythmias	Fluid retention Fatigue Hypotension Bradycardia Heart block
Inotropic Agents Cardiac glycoside Digoxin	Increase force of myocardial contractility (positive inotrope) Increase cardiac output Decrease elevated sympathetic tone of the heart and blood vessels (previously compensating for sick heart with decreased contractility and cardiac output) Favorably affect electrical activity of heart	Dysrhythmias Hypokalemia Digoxin toxicity: anorexia, N/V, visual disturbances (blurred vision, yellow tinge to vision, halos around dark objects)

Continued

Table 2–1 Drug Classes for the Treatment of Heart Failure —cont'd

CLASS	MECHANISM OF ACTION (MOA)/INDICATION	ADVERSE EFFECTS
Sympathomimetics Dopamine Dobutamine	Increased force of myocardial contractility (positive inotrope) Promote vasodilation	Tachycardia Hypotension Dysrhythmias
Phosphodiesterase inhibitors Inamrinone Milrinone	Increased force of myocardial contractility (positive inotrope) Promote vasodilation	Tachyphylaxis Hypotension Dysrhythmias Thrombocytopenia Hypokalemia

Box 2–2 Safe Drug Classes to Use With Patients Diagnosed With Heart Failure (and its Comorbidities)

Antihypertensives
ACE inhibitors
Diuretics (loop, thiazide, potassium-sparing)
Angiotensin-II receptor blockers (ARBs)
Cardioselective beta blockers
Alpha blockers
Vasodilators (isosorbide dinitrate/hydralazine [BiDil])
Dyslipidemics
HMG-CoA reductase inhibitors (statins)
Fibrates
Niacin
Omega-3-acid ethyl esters
Cholesterol absorption inhibitors
Bile acid sequestrants
Antidysrhythmics (use only beta blockers or amiodarone)
Class 1: sodium channel blockers (class 1A: quinidine, procainamide, disopyramide; class IB: lidocaine, phenytoin, mexiletine; class IC: flecainide, propafenone)
Class II: beta blockers
Class III: potassium channel blockers (bretylium, amiodarone)
Class IV: calcium channel blockers (diltiazem, verapamil)
Other: adenosine, digoxin

Box 2–2 Safe Drug Classes to Use With Patients Diagnosed With Heart Failure (and its Comorbidities)—cont'd

Anticoagulants (comorbidity, atrial fibrillation, valve disease or replacement)
Heparin
Warfarin
LMW heparins (enoxaparin, dalteparin, tinzaparin)
Antiplatelet Drugs
Acetylsalicylic acid (ASA)
Adenosine diphosphate receptor antagonists (ticlopidine, clopidogrel)
Glycoprotein IIb/IIIa receptor antagonists (tirofiban, eptifibatide, abciximab)

- Prevent edema and its sequelae.
- Prevent or recognize exacerbation of heart failure.
- Understand and promote adherence to all treatment modalities.
- Reduce anxiety about heart failure and its complications.

P—Purpose

- Provide optimal care for the patient with heart failure.

E—Evidence

- ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult.

A—Action

- Foster health-promoting activities, including smoking cessation, weight reduction, and yearly immunizations.
- Educate patients about the need to monitor their BP, daily weight, peripheral edema, exercise tolerance, and medication use.
- Explain to patients about formal testing that may be required and understanding the significance of the test results. Testing may include: echocardiogram, ECG, and laboratory results.
- Educate patients to report the following S/S to their primary care provider: dyspnea (on exertion, at night, or lying down); frequent cough; fatigue and weakness; edema of the ankles, feet, or abdomen; nausea; dizziness; weight gain of 3 lb in 2 days or 5 lb in 1 week.

K—Knowledge

- Definition of heart failure
- Causes of heart failure
- Classifications of heart failure

ALERT

Recognize and report clinical manifestations of digoxin toxicity: nausea/vomiting (N/V), anorexia, yellow tinge to vision and/or visual halos around objects, dysrhythmias, fatigue, and drowsiness.

- Clinical manifestations and compensatory mechanisms of heart failure
- S/S of an exacerbation of heart failure
- Complications of heart failure
- Patients at higher risk for developing heart failure
- Treatment modalities of heart failure
- Advocacy for end-of-life issues in patients with end-stage heart failure

Box 2–3 outlines the important NCLEX-RN topics regarding the cardiovascular system.

CLINICAL VOICE: ACUTE HEART FAILURE AND LIFE-SAVING ACTIONS

A 93-year-old woman arrived at an outpatient clinic with her son. She had been staying at a residential facility to receive care for multiple medical conditions. Nursing staff sent her for evaluation due to weight gain of 13 lb in 1 week, which was particularly noticeable considering her normal weight of 103 lb. She also had increased peripheral edema, lack of appetite, and audible oropharyngeal wheezes with cough. Her family nurse practitioner immediately admitted her to the hospital for suspected acute exacerbation of heart failure. Indeed, she was in acute heart failure and received intravenous diuretic therapy. Two days later, the nurse practitioner was able to discharge her to the residential facility, on oxygen and increased doses of diuretics. Shortly thereafter, she recovered to her baseline. Her life was saved from premature death.

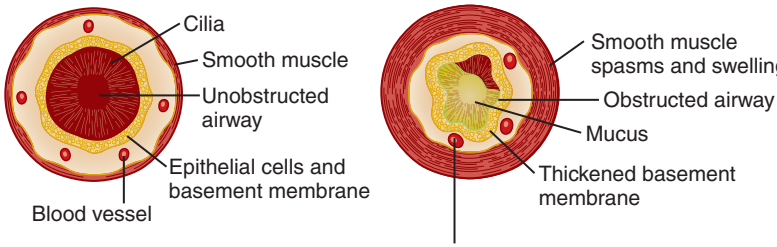
Box 2–3 Important NCLEX-RN Topics on the Cardiovascular System

- Dysrhythmias
- HTN
- CAD, ischemic heart disease, angina, MI, acute coronary syndrome
- Pericarditis, myocarditis, endocarditis
- Cardiac tamponade
- Valve disease
- Cardiomyopathies
- Vascular disorders (deep vein thrombosis, phlebitis, venous insufficiency, varicose veins, peripheral arterial disease, Raynaud's phenomenon, Buerger's disease, aortic aneurysm)

Asthma and COPD

Asthma is a complex, chronic inflammatory disorder of the airways resulting in *reversible* airflow obstruction. The major factors of this airflow obstruction are bronchial hyper-responsiveness to irritant or allergen stimuli, bronchoconstriction, airway inflammation with edema, overproduction of mucus, and bronchospasm (Fig. 2–4). Immunoglobulins (specifically IgE) attach to the histamine-containing mast cells or a "trigger" antigen. Mast-cell degradation occurs, releasing inflammatory mediators such as histamine, leukotrienes, prostaglandin, and bradykinin. Cytokines are also released and include tumor necrosis factor (TNF) and interleukin-1 (IL-1). The pathophysiological effects of

Comparing the anatomy of a bronchiole—normal vs. obstructed due to asthma



Engorged blood vessels bring eosinophils and mast cells to area.

IgE-covered mast cells initiate the immune and the inflammatory response. Histamines, leukotrienes, and prostaglandins produce swelling of large and small bronchioles' smooth muscle, stimulate mucus production, and increase permeability of blood vessels, thus further narrowing the bronchial lumen and altering the ventilation-perfusion ratio.

On inhalation, the narrowed bronchiole lumen allows some air in but on exhalation the increased intrathoracic pressure and excess mucus "trap" air in the small, narrowed bronchioles. In asthma, this is **REVERSIBLE** (see also COPD) but causes the following:	• Bronchospasms • Vascular congestion • Mucous secretion • Impaired mucociliary escalator • Thickening of airway walls • Increased contractile response of bronchial smooth muscle

FIGURE 2-4: Comparing the anatomy of a normal with an obstructed bronchiole.

ALERT

Ominous signs and symptoms for exacerbation of asthma are: pallor, fatigue, frightened affect, diminished or absent breath sounds, difficulty lying down, respiratory muscle fatigue, cyanosis, forced expiratory volume in 1 second (FEV_1, a lung capacity test) <30%, normal to elevated $PaCO_2$ (respiratory acidosis).

The following key S/S are likely indicators of the diagnosis of asthma: cough (especially at night), wheeze, and chest tightness or shortness of breath. These S/S often worsen with exercise, infection, exposure to inhaled allergens (animal dander), exposure to irritants (smoke), changes in the weather, strong emotional expression, stress, and menstrual cycle.

the release of these mediators produce the clinical manifestations of asthma:

- Histamine causes swelling of the bronchial smooth muscle and stimulates mucus production, vascular dilation, and increased blood vessel wall permeability, called vascular leak syndrome (VLS).
- Leukotrienes (LT) also cause swelling of the bronchial smooth muscle and VLS.
- Prostaglandins (PG) cause pain and VLS.
- Bradykinin causes vasodilation, acts with PG to produce pain, results in a slow-response vascular smooth muscle contraction, induces VLS, and may increase white blood cell chemotaxis.
- This reversible airway obstruction causes cough, wheeze, and chest tightness.

Pharmacology and Asthma

Asthma produces a reversible obstruction of both small and large airways of the lungs. Rapid-acting bronchodilators are the key to reverse the bronchoconstriction that narrows the airways. Anti-inflammatory agents, such as systemic or inhaled corticosteroids, mast cell stabilizers, and leukotriene modifiers, decrease the chronic airway hyperresponsiveness and edema that worsen airway obstruction (Table 2–2).

PEAK PERFORMANCE: USING INHALERS

Take action to teach patients to use their inhalers:

1. Get ready. Take off the cap, and shake the inhaler. Breathe out all of your air. Hold your inhaler and spacer in your mouth.
2. Breathe in slowly. Press down on the inhaler once. With a spacer, breathe in a few seconds after pressing on the inhaler. Keep breathing in.
3. Hold your breath for 10 seconds or as long as you can. Wait 15–30 seconds, then repeat for a short-acting beta-agonist. (There is no need to wait between puffs for other types of inhalers.)
4. If taking two inhalers at once, take the short-acting beta-agonist (i.e., albuterol) first, then the inhaled corticosteroid. Always rinse your mouth after taking a steroid inhaler.

Table 2–2 Drug Classes for the Treatment of Asthma/COPD

CLASS	MOA/INDICATION	ADVERSE EFFECTS
Inhaled Short-Acting Beta$_2$ Agonists Albuterol (Ventolin, Proventil) Pirbuterol (Maxair)	Acute bronchospasm in asthma, COPD	Paroxysmal bronchospasm, nervousness, tremors, headache, palpitations, tachycardia, dizziness
Inhaled Long-Acting Beta$_2$ Agonists Formoterol (Foradil, Perforomist) Salmeterol (Serevent) Arformterol (Brovana)	Maintenance therapy in asthma, COPD	Infection, tremor, dizziness, insomnia, dystonia, paroxysmal bronchospasm
Inhaled Anti-Inflammatory Cromolyn sodium (Intal) Nedocromil (Tilade)	Maintenance therapy in asthma	Unpleasant taste, GI upset
Inhaled Anticholinergics: Short-Acting Ipratropium bromide (Atrovent) Ipratropium (Atrovent HFA)	Asthma, COPD	Cough, nervousness, dizziness, GI upset, anticholinergic effects (dry mouth, urinary retention, constipation, increased HR, blurred vision)
Inhaled Anticholinergics: Long-Acting Tiotropium (Spiriva)	Asthma, COPD	Anticholinergic effects (dry mouth, urinary retention, constipation, increased HR, blurred vision), glaucoma, bronchospasm, angioedema
Inhaled IgE Antagonist or Monoclonal Antibody Omalizumab (Xolair)	Moderate-to-severe persistent asthma	Injection site reactions, infection, malignancy
Inhaled Corticosteroids Beclomethasone (QVAR) Budesonide (Pulmicort) Flunisolide (Aerobid) Fluticasone (Flovent) Mometasone (Asmanex) Triamcinolone (Azmacort)	Maintenance therapy in asthma, severe COPD	Hoarseness, dry mouth, oral candidiasis, headache, GI upset

Continued

Table 2–2 Drug Classes for the Treatment of Asthma/COPD —cont'd		
CLASS	**MOA/INDICATION**	**ADVERSE EFFECTS**
Inhaled Combination Drugs Albuterol/Ipratropium (Combivent; Duoneb) Fluticasone/salmeterol (Advair) Budesonide/formoterol (Symbicort)	Maintenance therapy in asthma, COPD	Respiratory tract infection, laryngeal spasm, headache, dizziness, hoarseness, dysphonia, paradoxical bronchospasm
Methylxanthines Aminophylline Theophylline Theo-24	Moderate-to-severe persistent asthma, COPD	GI upset, headache, central nervous system (CNS) stimulation, arrhythmias, seizures
Systemic Corticosteroids Methylprednisolone	Severe asthma, COPD	May mask infection; may suppress hypothalamic-pituitary-adrenal axis; glaucoma, hypokalemia, hypocalcemia, hypernatremia, HTN, psychiatric disturbance
Leukotriene Receptor Antagonist Montelukast (Singulair) Zafirlukast (Accolate) Zileuton (Zyflo)	Prophylaxis and chronic treatment of asthma	Headache, fatigue, GI upset
Vaccines Influenza Pneumococcal	Prophylaxis of infection in asthma, COPD	Local irritation at the injection site, low-grade fever, malaise and myalgias; rare hypersensitivity reaction
Antibiotics Doxycycline (Vibramycin) Sulfamethoxazole-trimethoprim (Bactrim) Amoxicillin-clavulanate (Augmentin) or clarithromycin (Biaxin) Azithromycin (Zithromax) Moxifloxacin (Avelox) O_2	COPD exacerbation Classes used to treat *Streptococcus pneumonia, Haemophilus influenza, Moraxella catarrhalis, Chlamydia pneumonia,* and *Mycoplasma pneumonia* COPD	Anorexia, nausea, vomiting, and diarrhea (N/V/D) are common; take with a full glass of water to prevent esophageal ulcers, rashes, photosensitivity; allergic reactions such as erythema multiforme and Stevens-Johnson syndrome

Table 2–2 Drug Classes for the Treatment of Asthma/COPD —cont'd

CLASS	MOA/INDICATION	ADVERSE EFFECTS
		Hepatic failure Pseudomembranous colitis
Smoking Cessation Agents Nicotine (Nicoderm CQ, Nicotrol patch, Nicotrol NS, Nicotrol inhaler) Nicotine polacrilex (Commit lozenge, Nicorette)	Asthma, COPD Nicotine replacement therapy	Headache, dizziness, palpitations, HTN; local irritation
Varenicline (Chantix)	Asthma, COPD	Nausea, GI upset, sleep disturbance, headache
Bupropion (Zyban)	Asthma, COPD	Dry mouth, insomnia, anxiety, dizziness

To maintain evidence-based nursing practice, periodically check clinical guidelines such as the National Heart, Lung, and Blood Institute/National Asthma Education and Prevention Program (NHLBI/NAEPP) for new drug classes used in the treatment of asthma. Recent additions include monoclonal antibody or anti-IgE antibody, such as omalizumab (Xolair).

Desired Outcomes for Patients With Asthma

Increase your overall understanding of asthma with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Recognize early S/S of an asthma exacerbation and understand what to do in the event of an emergency.
- Prevent asthma exacerbations by removing environmental triggers, maintaining medication adherence, and promoting physical activity while considering comorbid complications.
- Understand and demonstrate skill in administering inhaled asthma medications, monitoring persistent asthma, and addressing worsening S/S.

P—Purpose

- Recommended care of the patient with asthma.

E—Evidence

- NHLBI/NAEPP EPR-3 (2007) guidelines for the diagnosis and management of asthma.

A—Action

- Educate patients about the basic facts of asthma (definition, simple pathophysiology, what happens to airways during an asthma attack).

K—Knowledge

- Definition
- Components of care: assessment and monitoring; education; control of environmental factors and comorbid conditions; medications
- Stepwise approach to asthma management
- Management of asthma exacerbations

Chronic Obstructive Pulmonary Disease

COPD is a complex syndrome of chronic airway obstruction and inhibition of airflow on expiration. According to the National Center for Health Statistics, COPD (or chronic lower respiratory disease) is the fourth leading cause of death after heart disease, cancer, and stroke. COPD causes a progressive, *irreversible* airflow obstruction, often manifested by emphysema, chronic bronchitis, or both (Figs. 2–5 and 2–6).

Normally, the respiratory drive comes from the concentration of carbon dioxide in the blood ($Paco_2$). Patients with COPD live in a state of chronic hypercapnia. Therefore, their drive to breathe comes from low oxygen saturation (Pao_2) rather than an elevated $Paco_2$. Administration of supplemental oxygen therapy is usually prescribed to raise the Pao_2 to 60–65 mm Hg or the saturations from 90% to 92%. Higher flow rates usually do not help, and they can even be dangerous considering the alteration in these patients' drive to breathe.

The most common cause of COPD is tobacco smoke. In smokers, nicotine paralyzes the beating of the protective cilia (mucociliary escalator), so mucus and bacteria remain in the lungs. This entrapment increases the likelihood of infection and further complicates airway clearance. As infection and irritant injury continue, the bronchial walls become inflamed and thickened from edema and inflammatory cells. Over time, persistent injury and inflammation lead to bronchospasm and permanent narrowing

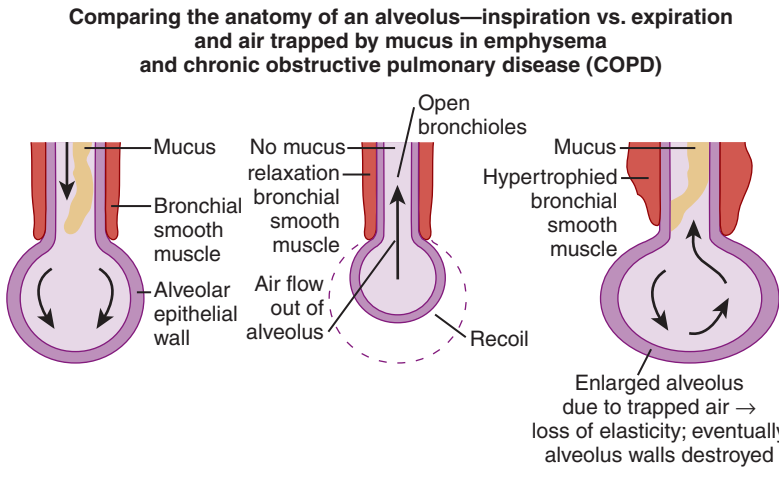


FIGURE 2-5: Comparing the anatomy of a normal with an abnormal alveolus.

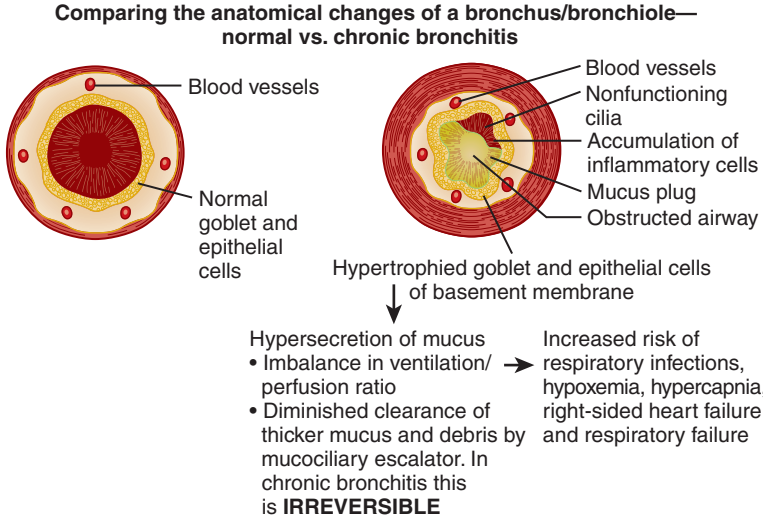


FIGURE 2-6: Comparing the anatomy of a normal with an abnormal bronchiole.

of the larger bronchi and eventually the smaller airways. Other causes of COPD include:

- Chronic airway infection by *Streptococcus pneumonia, Haemophilus influenza, Moraxella catarrhalis, Chlamydia pneumonia,* and *Mycoplasma pneumonia*
- Air pollution
- Occupational exposure
- Alpha$_1$ antitrypsin deficiency, a hereditary disorder

Emphysema results from permanent dilation and destruction of the alveolar ducts (see Fig 2–5). An inflammatory process, emphysema commonly results from inhalation of cigarette smoke. Toxins from smoke cause a release of cytokines that increase the action of protease. The action of protease on elastin in the alveolar septa causes the destruction of the septa, reducing elastic recoil and trapping air in the alveoli. The resultant bulla and blebs cause hyperinflation and difficulty exhaling air. This air trapping occurs because mucous plugs form deep in the alveolar tissues and cause a narrowing of the small airways. The action of inspiration pulls the narrowed airway walls apart enough for air to flow past the narrowing. During the relaxation phase, or expiration, the decreased elastic recoil of the small airways, due to the loss of elastin, causes the walls of the airways to collapse, trapping the air inside the alveoli. Pursed-lip breathing techniques help force more air out of the lungs during expiration.

Chronic bronchitis (see Fig. 2–6) is characterized by hypersecretion of mucus, which occurs as inspired irritants increase not only mucus production but also the number of mucous glands and the number of goblet cells in the airway epithelium. Chronic bronchitis causes bacteria to embed in the airway secretions and diminishes the beating action of the airway cilia.

PEAK PERFORMANCE: MANIFESTATIONS OF COPD

Know the characteristic manifestations for emphysema and chronic bronchitis.
Common manifestations of emphysema include:

- Barrel chest
- Prolonged expiration
- Dyspnea

Common manifestations of chronic bronchitis include:

- A productive cough occurring most days of the week, over 3 months of the year, during the past 2 years, without any other explanation
- Elevated red blood cell (RBC) count/hematocrit level
- Prolonged expiration

Desired Outcomes for Patients With Dyspnea and COPD

Increase your overall understanding of dyspnea and COPD with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Patients will develop self-assessment skills of S/S of stable or worsening dyspnea.
- Patients will perform the necessary skills to self-administer inhaled medications accurately.
- Patients will follow their individualized plan of care and notify their health-care provider or seek emergent care for unstable dyspnea.
- Patients will participate in health-promoting activities (smoking cessation, exercise, yearly immunizations, and disease self-management strategies).

ALERT

Instruct patients with COPD to contact their primary health-care provider if the following develop: fever and/or chills, worsening dyspnea, increased amounts of sputum and/or a change in the color or character of their sputum, and worsening fatigue.

The NCLEX-RN examination also focuses on several COPD topics (Box 2–4). The severity of COPD can also be classified into stages as shown in Box 2–5.

Box 2–4 Important NCLEX-RN Topics Related to COPD

- Rib fracture
- Pneumothorax
- Acute respiratory distress syndrome (ARDS)
- Respiratory failure
- Sudden acute respiratory syndrome (SARS)
- Pneumonia
- Pleural effusion
- Empyema
- Pleurisy
- Pulmonary embolism (PE)
- Lung cancer
- Carbon monoxide poisoning
- Histoplasmosis
- Sarcoidosis
- Silicosis
- Tuberculosis
- Diagnostics related to the respiratory system

Box 2–5 Classification of COPD Severity

- Stage 0: At risk: chronic cough and sputum production; normal lung function
- Stage I: Mild COPD: FEV_1/forced vital capacity (FVC) <70%; FEV_1 ≥80% predicted
- Stage II: Moderate COPD: FEV_1/FVC <50%; FEV_1 <80% predicted
- Stage III: Severe COPD: FEV_1/FVC <30%; FEV_1 <50% predicted
- Stage IV: Very severe COPD: FEV_1 <30% predicted

P—Purpose

- Recommended care of the patient with dyspnea and COPD

E—Evidence

- Nursing care of dyspnea: The 6th vital sign in individuals with chronic obstructive pulmonary disease (COPD). *Registered Nurses Association of Ontario,* 2005

A—Action

- Nurses will assess all patients having dyspnea related to COPD and accept patients' self-report of their dyspnea (measure using a quantitative scale such as the Medical Research Council Dyspnea Scale).
- Respiratory assessment includes current level of dyspnea; usual level of dyspnea; identification of stable versus unstable dyspnea; related parameters: vital signs, pulse oximetry, chest auscultation, chest wall movement and shape, presence of peripheral edema, use of accessory muscles, presence of cough/sputum, ability to speak a full sentence, and level of consciousness.

K—Knowledge

- Definition and pathophysiology of the group of disorders
- Respiratory and dyspnea assessment
- Medications used to treat COPD
- Prescribed oxygen therapy
- Secretion clearance strategies
- Ventilation modalities, both noninvasive and invasive
- Strategies for energy conservation in patients
- Relaxation techniques used for patients with dyspnea
- Strategies to maintain adequate nutrition
- Breathing strategies

CLINICAL VOICE: COPD AND LUNG TRANSPLANT

A patient developed COPD at age 50 years, after smoking cigarettes for only 10 years. He was hospitalized every 4–6 weeks as he developed frequent respiratory tract infections and severe dyspnea. During this time he was evaluated for a lung transplant and put on the waiting list. After approximately 6 months on the list he decided to sign a Do Not Resuscitate (DNR) form. He did not want to be placed on a ventilator and require his wife and daughters to make the decision to remove him. One week later he was admitted to the hospital for acute respiratory failure. His wife and pulmonologist talked him into rescinding the DNR order. He was placed on a ventilator then and two more times before he received his lung transplant. He has lived with his new lung for 6 years and has felt well, even healthy.

Gastroesophageal Reflux Disease

GERD occurs when a backflow or reflux of gastric contents enters the esophagus. Pathophysiological processes of GERD include:

- Decrease in lower esophageal sphincter (LES) tone due to certain foods, and/or
- Increase in intra-abdominal pressure (IAP) due to obesity, pregnancy, or hiatal hernia, which results in the flow of gastric contents from the stomach through the LES into the esophagus, and/or
- Decrease in esophageal emptying due to impaired esophageal motility or slowed gastric emptying, and/or
- Defect in mucosal lining of the esophagus

Both intrinsic smooth muscle at the distal esophagus and skeletal muscle of the diaphragm may comprise the entire LES mechanism (Fig. 2–7). Reflux of gastric contents into the esophagus may initiate an inflammatory response, which causes damage to the esophageal lining, resulting in an increased risk for Barrett's esophagus and esophageal adenocarcinoma. The S/S found during an assessment of a patient suspected of having GERD include:

- Pyrosis (heartburn)
- Dyspepsia (indigestion or epigastric pain)
- Regurgitation
- Pain with swallowing or a globus sensation or “lump” in the throat
- Hypersalivation

GERD worsens with lying down or bending over and with substances that decrease LES tone or increase gastric acid production:

- Chocolate
- Citrus

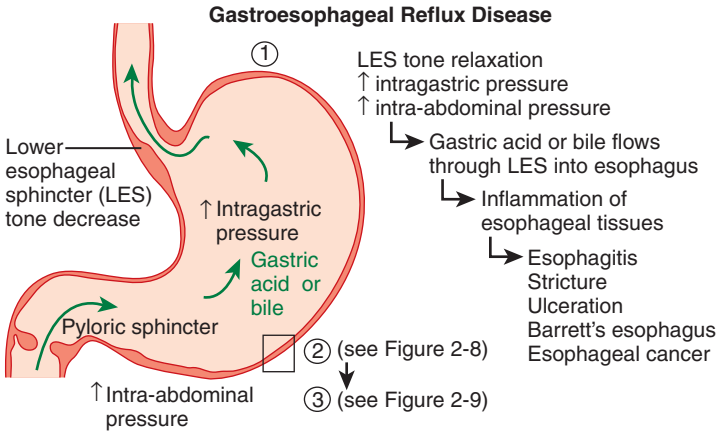


FIGURE 2-7: Lower esophageal sphincter tone.

- Mints
- Coffee
- Tomato
- Spicy foods
- Carbonated beverages
- Fatty/fried foods
- Alcohol
- Smoking

Foods high in lean protein increase LES and protect the esophagus, whereas gastrin, trypsin, and bile salts are corrosive to the cells lining the esophagus. Also, *Helicobacter pylori* and PUD are often associated with GERD. Interventions used to treat GERD include:

- Wear loose-fitting clothing at the waist.
- Avoid chewing gum or sucking on hard candy.
- Make lifestyle changes (lose weight; eat small, frequent, low-fat meals; separate meals and bedtime or lying flat by 3 hours; elevate the head of the bed on 6-inch blocks).

Table 2–3 lists the most common medications.

Acid suppression is the mainstay of treatment for GERD. Proton pump inhibitors (PPIs) provide the most rapid resolution of S/S and healing of the reflux irritation. As a chronic condition, GERD requires continued therapy to control symptoms and prevent complications. If lifestyle changes and medications do not resolve the S/S, surgical intervention may

Table 2–3 Drug Classes for the Treatment of GERD/PUD

CLASS	MOA	ADVERSE EFFECTS
Antibiotics/Antimicrobials Amoxicillin Bismuth Clarithromycin Metronidazole Tetracycline	Eradicate infection by *H. pylori* (PUD)	Amoxicillin: Rash, hypersensitivity reaction. Bismuth: Pepto-Bismol contains salicylates (aspirin: acetylsalicylic acid [ASA]) and may cause toxic levels if patient taking other doses of ASA; hypersensitivity reactions; not for use in children <16 years due to Reye's syndrome. Clarithromycin: Nausea, vomiting, and diarrhea (N/V/D), abdominal pain, abnormal taste; rare severe—Stevens-Johnson syndrome, hepatic failure. Metronidazole: Flu-like symptoms, metallic taste, vaginal candidiasis; severe—aplastic anemia; no ethanol (ETOH). Tetracycline: N/V/D, dizziness, photosensitivity; not for children <8 years due to yellow discoloration of teeth and problems with long bone growth.
Antisecretory: H_2-Receptor Antagonists Cimetidine Ranitidine Famotidine Nizatidine	Suppress secretion of gastric acid by blocking the histamine$_2$ receptor site at the proton pump in the stomach lumen parietal cells (GERD/PUD)	Cimetidine: CNS effects (hallucinations, confusion, lethargy, seizures), antiandrogenic effects (gynecomastia, impotence, decreased libido) Ranitidine/nizatidine: Reduction in gastric pH, increased risk of pneumonia Famotidine: Reduce dose in renal failure

Continued

Table 2–3 Drug Classes for the Treatment of GERD/PUD —cont'd		
CLASS	**MOA**	**ADVERSE EFFECTS**
Antisecretory: Proton Pump Inhibitors Omeprazole Esomeprazole Lansoprazole Rabeprazole Pantoprazole	Suppress secretion of gastric acid by blocking final common pathway of gastric acid production at proton pump in the stomach lumen parietal cells (irreversibly blocks proton-potassium ATPase enzyme); effectively stops production of basal and stimulated acid release (GERD/PUD)	Omeprazole: Headache, N/V/D; reduction in gastric pH, increased risk of pneumonia; blocks absorption of some HIV/antifungal drugs; increased risk of gastric cancer with long-term use (in animals) Lansoprazole/pantoprazole: If given via IV infusion, use a filter
Antisecretory: Muscarinic Antagonists Atropine Pirenzepine	Rarely used; suppress secretion of gastric acid by blocking acetylcholine (Ach) receptor site at proton pump in the stomach lumen parietal cells	Doses needed to treat ulcer cause significant anticholinergic side effects (dry mouth, constipation, urinary retention, visual disturbances)
Mucosal Defense: Prostaglandin (PG) Analog Misoprostol	Replaces endogenous prostaglandins, which: Suppress secretion of gastric acid at proton pump Promote secretion of bicarbonate and cytoprotective mucus Maintain submucosal blood flow by promoting vasodilation (GERD/PUD)	Diarrhea, abdominal pain, dysmenorrhea Pregnancy category X because PG stimulates uterine contractions
Mucosal Defense: Antacids Aluminum (Amphojel) Aluminum/magnesium combination (Gaviscon, Mylanta, Maalox, Magaldrate)	Neutralize gastric acid to decrease destruction of stomach lumen and parietal cells; decrease pepsin activity; stimulate prostaglandin production (GERD/PUD)	Aluminum: Constipation; binds with many drugs (tetracycline, warfarin, digoxin) and with phosphate Aluminum/magnesium: Use if aluminum only causes constipation

Table 2–3 Drug Classes for the Treatment of GERD/PUD —cont'd

CLASS	MOA	ADVERSE EFFECTS
Magnesium (Milk of Magnesia) Calcium (Tums, Rolaids) Other		Magnesium: Diarrhea; use with caution in renal insufficiency Calcium: Constipation; may cause acid rebound; releases CO_2 and results in belching and flatulence Sodium: Affects pH; typically not used as antacid but for acid-base imbalances
Mucosal Defense: Barrier Agent Sucralfate	Produces a gel-like coating over the crater of the ulcer, preventing further injury to the area by gastric acid (PUD)	Not systemically absorbed—few side effects; constipation
Combination Treatment for Eradication of *H. pylori:* Amoxicillin + clarithromycin + proton pump inhibitor (PPI); or Metronidazole + clarithromycin + PPI; or Bismuth + metronidazole + tetracycline + PPI	Suppress secretion of gastric acid by blocking final common pathway of gastric acid production at proton pump; destroys bacteria by weakening cell wall ("cillins") or inhibiting protein/DNA synthesis (PUD)	See individual medications

be required to reduce reflux of gastric contents. Anti-reflux surgical procedures include:

- Laparoscopic Nissen's fundoplication
- Toupet's fundoplication
- Endoscopic valvuloplasty

Desired Outcomes for Patients With GERD

Increase your overall understanding of GERD with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Understand the definition, pathophysiology, risk factors, and treatment modalities for GERD.

- Prevent complications of GERD such as esophagitis, esophageal stricture, Barrett's esophagus, respiratory irritation, and insomnia.
- Achieve any necessary goals for weight loss, smoking cessation, or alcohol cessation.

P—Purpose

- Care for the patient with GERD and prevent complications of the disorder

E—Evidence

- Updated guidelines for the diagnosis and treatment of gastroesophageal reflux disease, *American College of Gastroenterology* (2005)

A—Action

- Educate patients about the facts of GERD (definition, simple pathophysiology, what happens to the esophagus if lifestyle modifications or medications are not implemented).
- Assess patients for baseline S/S; monitor for worsening S/S or complications.
- Educate patients' families about lifestyle modifications to treat GERD.
- Explain the use of various diagnostic tests (endoscopy, ambulatory pH monitoring, esophageal manometry).
- Assess the use of over-the-counter (OTC) antacids, acid suppressants, or prescription medications with patients and their families.
- Explain that GERD is a chronic condition and that treatment needs to be ongoing and monitored for its effectiveness.

K—Knowledge

- Understand the definition of the disorder and the various pathological disease processes
- Know those patients at increased risk for developing GERD and S/S of the disorder
- Know the importance of educating at-risk patients in lifestyle changes, medications, and other treatment modalities
- Identify when patients should contact their primary health-care provider: patients report continuous abdominal or epigastric pain; patients report crushing pain to chest; pain worsens after exercise; stools have bright red blood or appear black and tarry; patients experience unintentional weight loss

ALERT

Continuous damage to the esophagus by gastric contents produces an inflammatory response in the esophageal mucosal lining, which can lead to Barrett's esophagus and ultimately to esophageal cancer. Refer patients for evaluation of complications of GERD when they present with the following S/S: respiratory bronchospasm, dental erosion, dysphagia, early satiety, chest pain, weight loss, blood loss, N/V, sore throat/hoarseness, and chronic cough.

CLINICAL VOICE: DELAY IN CARE RESULTS IN POOR PATIENT OUTCOME

A 55-year-old patient had complaints of epigastric pain and occasional chest pain. He was an engineer in a very stressful job and had not missed work for a sick day in 23 years. His pain was on and off, and the S/S of GERD had been present "for as long as I can remember." He also had a family cardiac history but no chest pain at the time of his appointment. He was referred to both a gastroenterologist and a cardiologist. He missed his cardiology appointment (because of a meeting at work), but he saw the gastroenterologist, who performed an upper endoscopy the next day and found invasive esophageal cancer in his esophagus and stomach. The patient declined further workup on his heart and worked for a few more weeks. He died 4 months later in the care of his sister.

Peptic Ulcer Disease

PUD is an ulceration of the gastrointestinal (GI) mucosa from exposure to gastric acid and pepsin. Typically, ulcers occur in the stomach and duodenum. Gastric or stomach ulcers are more common in older men who smoke and/or drink alcohol or in patients who regularly use nonsteroidal anti-inflammatory drugs (NSAIDs). Gastric ulcers are associated, on rare occasions, with gastric cancer. Gastric ulcer pain is often described as gnawing or sharp in the mid-to-left epigastric area.

Abdominal or epigastric pain worsens with ingestion of food. Duodenal ulcers are the most common type of ulcer and are rarely associated with malignancy. Of duodenal ulcers, 95% are *H. pylori*–positive, and the burning, midepigastric abdominal pain improves with food intake. Additional S/S are:

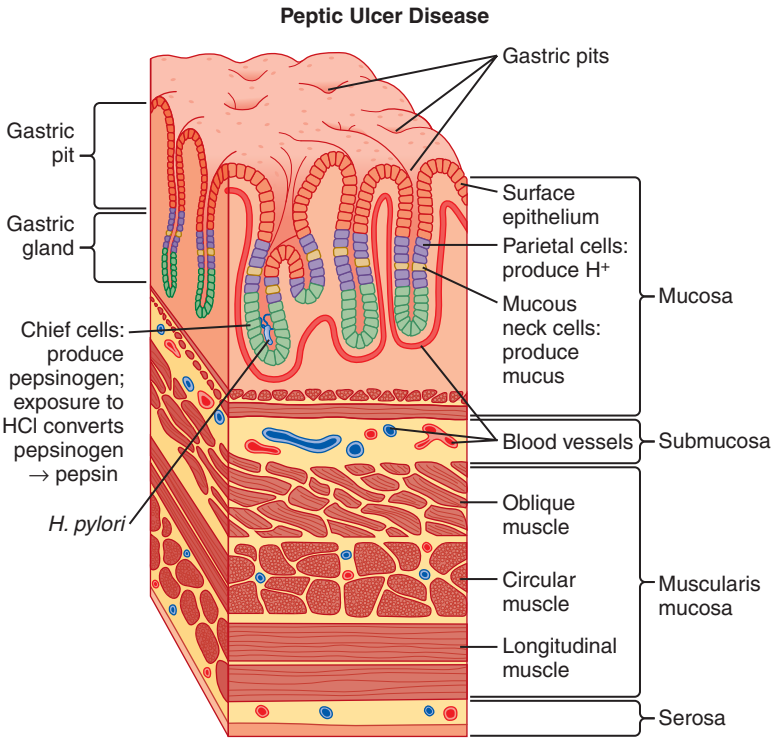
- N/V
- Belching or bloating
- Anorexia
- Hemetemesis (less common)
- Hematochezia
- Melena

The pathophysiology of PUD typically begins with a defect in the stomach mucosal lining. Increased secretion of gastric acid, together with pepsin, and an infection by *H. pylori* (gram-negative rod, flagellated microbe) result in release of the enzyme urease (Figs. 2–8 and 2–9). This release provokes a cascade of events:

- Urease catalyzes the hydrolysis of urea to produce ammonia.
- Ammonia neutralizes gastric acid but is toxic to the lining of the stomach.

- The inflammatory process begins and damages the mucosal lining through autodigestion.

NSAID use may also cause damage to the mucosa directly and indirectly through inhibition of protective prostaglandins, mucus, and bicarbonate.



- Ulcers may be due to too many aggressive factors (*H. pylori*, NSAIDs, HCl pepsin, cigarette smoking, alcohol) or too few defensive factors (mucus, bicarbonate, blood flow, PG)

- HCl, from the stomach lumen, erodes the superficial mucosa layer. Over time it may penetrate the muscle layers, the underlying blood vessels, and even the gastrointestinal wall. This can result in a life-threatening GI bleed.

FIGURE 2-8: PUD pathophysiology at the gastric pit.

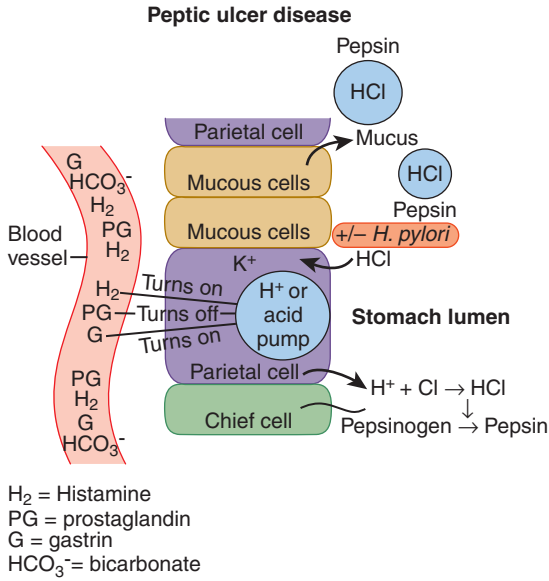


FIGURE 2-9: PUD pathophysiology.

Both of these pathological mechanisms may result in chronic gastritis or ulceration in the stomach mucosal lining. Interventions for the patient with PUD depend on the cause of the ulcer and include:

- Monitoring vital signs (VS)
- Monitoring for S/S of GI bleed
- Administering bland diet and medications (see Table 2–3)
- Providing education about the cause(s), S/S, lifestyle modifications, medications, and complications to the patient and family

Pharmacology and PUD

Pharmacological treatment of PUD depends on several factors. The presence of *H. pylori,* a hypersecretory disorder (Zollinger-Ellison syndrome), exposure of injured mucosal cells to pepsin, and smoking can exacerbate PUD. Often, treatment begins with a medication from the H_2-blocker or PPI classes for 8 weeks. Lifestyle changes, listed in the treatment of GERD, are also prescribed. Successful eradication of *H. pylori* infection in the stomach reduces the recurrence rate of PUD from 90% to less than 5%. To treat and eradicate an infection by *H. pylori,* a combination of a PPI and

antibiotics is used twice a day for 2 weeks, and then the PPI is continued for an additional 6 weeks. For example:

- PPI lansoprazole 30 mg one orally twice a day for 2 weeks
- Amoxicillin 500 mg two orally twice a day for 2 weeks
- Clarithromycin 500 mg two orally twice a day for 2 weeks

Other GI medication classes include:

- Laxatives (bulk-forming, surfactant, stimulant, osmotic, miscellaneous)
- Antiemetics
- Drugs for motion sickness
- Antidiarrheal agents
- Drugs to treat irritable bowel syndrome
- Drugs to manage inflammatory bowel disease
- Prokinetic agents
- Palifermin
- Pancreatic enzymes
- Drugs to dissolve gallstones
- Anorectal preparations

For active bleeding:

- Monitor the patient's VS
- Assess for S/S dehydration or hypovolemia
- Maintain the patient's nothing-by-mouth (NPO) status
- Monitor serial hemoglobin and hematocrit (H & H) levels
- Administer blood products as ordered
- Place a nasogastric (NG) tube when ordered for stomach lavage or decompression
- Give vasoactive agents as ordered

For gastric resection:

- Assess the patient for dumping syndrome: N/V, abdominal cramping, diarrhea, tachycardia, diaphoresis, dizziness, borborygmi

ALERT

Monitor patients for three major PUD complications: hemorrhage, perforation, and obstruction.

Desired Outcomes for Patients With PUD

Increase your overall understanding of PUD with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Patients and their families understand and adhere to prescription therapies and lifestyle modifications for PUD.
- Patients resolve their epigastric pain and other S/S.

- Patients resolve their infection (if *H. pylori* +).
- Patients are free from complications of PUD.
- Patients' ulcers will heal.

P—Purpose

- Provide guidelines for the diagnosis, treatment, and prevention of PUD and its related *H. pylori* infection.

E—Evidence

- Peptic ulcer disease guideline, University of Michigan Health System 2005

A—Action

- Assess patient history for S/S of uncomplicated or complicated PUD.
- Educate the patient/family about lifestyle modifications to treat PUD.
- Explain the use and cost-effectiveness of various diagnostic tests (fecal *H. pylori* antigen test or urea breath test versus serology or endoscopy).
- Assess the use of OTC antacids, acid suppressants, or prescription medications with the patient/family.
- Review treatment plan for PUD and/or *H. pylori*.

K—Knowledge

- Etiology and pathophysiology of GERD
- Clinical manifestations
- Complications (prevention of and treatment) related to PUD and *H. pylori*
- Diagnostic examinations related to PUD and *H. pylori*
- Those at increased risk for developing PUD, *H. pylori* infection, and S/S of the disorder
- Education of the patient in lifestyle changes, medications, and other treatment modalities (surgical options)
- When patients should contact their primary health-care provider: patients report continuous abdominal or epigastric pain; patients report crushing pain to chest; pain worsens after exercise; stools have bright red blood or appear black and tarry; patients experience unintentional weight loss

Diabetes Mellitus

DM is a group of metabolic disorders consisting of impaired carbohydrate, protein, and lipid metabolism resulting from a lack of insulin, the effects

of the lack of insulin, or both. The resulting state of continuous hyperglycemia produces the following S/S:

- Polyuria (frequent urination)
- Polydipsia (excess thirst)
- Polyphagia (excess hunger)
- Fatigue
- Weight loss

Diabetes is on the rise as the population ages and becomes increasingly obese. Recent DM prevalence statistics for the United States showed 20.8 million people (7% of the population) have diabetes. Of that figure, an estimated 6.2 million have yet to be diagnosed. The most common types of DM include:

- Type 1 DM
- Type 2 DM
- Gestational DM (GDM)
- The "prediabetes" state of metabolic syndrome

Type 1 DM occurs when the pancreas no longer produces insulin. Genetic predisposition and a range of other factors are believed to trigger the autoimmune destruction of pancreatic beta cells. Patients with type 1 DM must take exogenous insulin to survive. If insulin is not given, the patient metabolizes fats for energy, which results in diabetic ketoacidosis (DKA). This type of DM was formerly called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes mellitus (Fig. 2–10).

In type 2 DM the pancreas may still produce insulin but body cells are now resistant to its action. Patients with this type of DM are often obese (particularly in the abdomen), have a strong genetic predisposition to the disorder, and are hypertensive and dyslipidemic. Type 2 DM may be treated with oral antidiabetic agents, insulin, or other new injectable antidiabetic agents. If type 2 DM is not controlled and hyperglycemia occurs, it may lead to another complication called hyperglycemia hyperosmotic nonketotic syndrome (HHNS). Patients' blood glucose levels are extremely high, and patients are severely dehydrated. Treatment includes intravenous insulin and fluids. This type of DM was formerly called non-insulin dependent diabetes (NIDDM) or adult-onset DM (Fig. 2–11).

GDM first occurs in pregnant women during their third trimester. During the postpartum stage, patients may become euglycemic, continue with impaired glucose metabolism, or develop frank DM. GDM occurs in 1%–14% of all pregnancies; 60% of these women will develop type 2 DM within 15 years after gestation.

Prediabetes and metabolic syndrome occur when glucose metabolism is impaired but not to the level of diabetes. Prediabetes is defined through

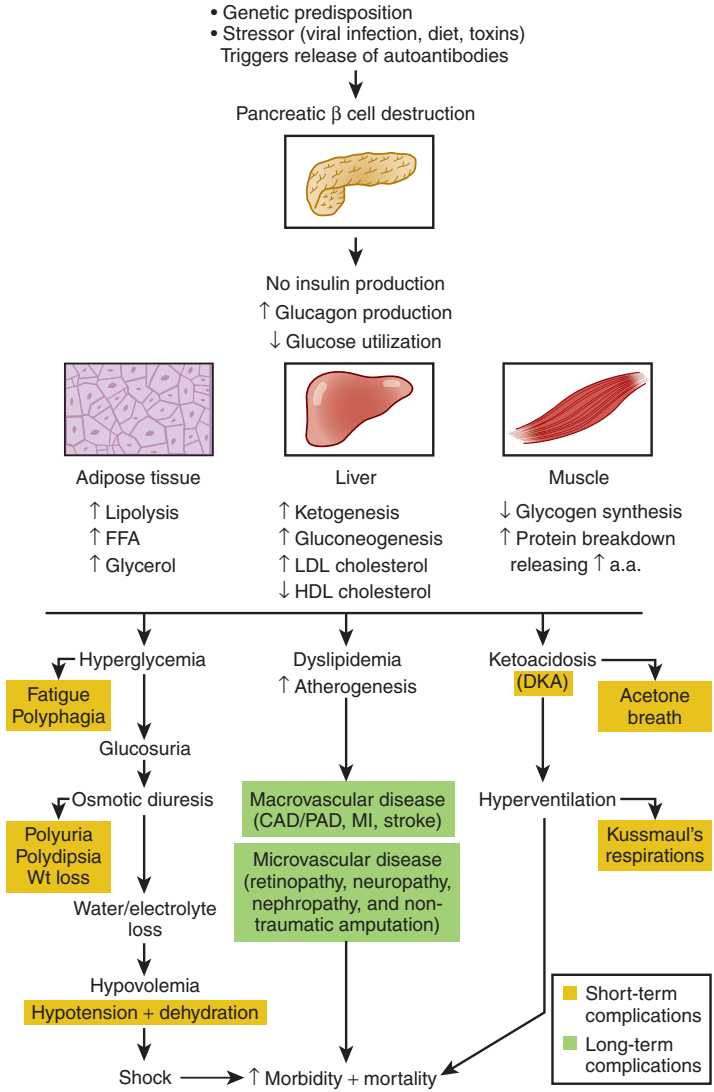


FIGURE 2-10: Pathophysiology of type 1 DM. DM = diabetes mellitus; FFA = free fatty acids; a.a. = amino acids; DKA = diabetic ketoacidosis; CAD = coronary artery disease; PAD = peripheral arterial disease; MI = myocardial infarction.

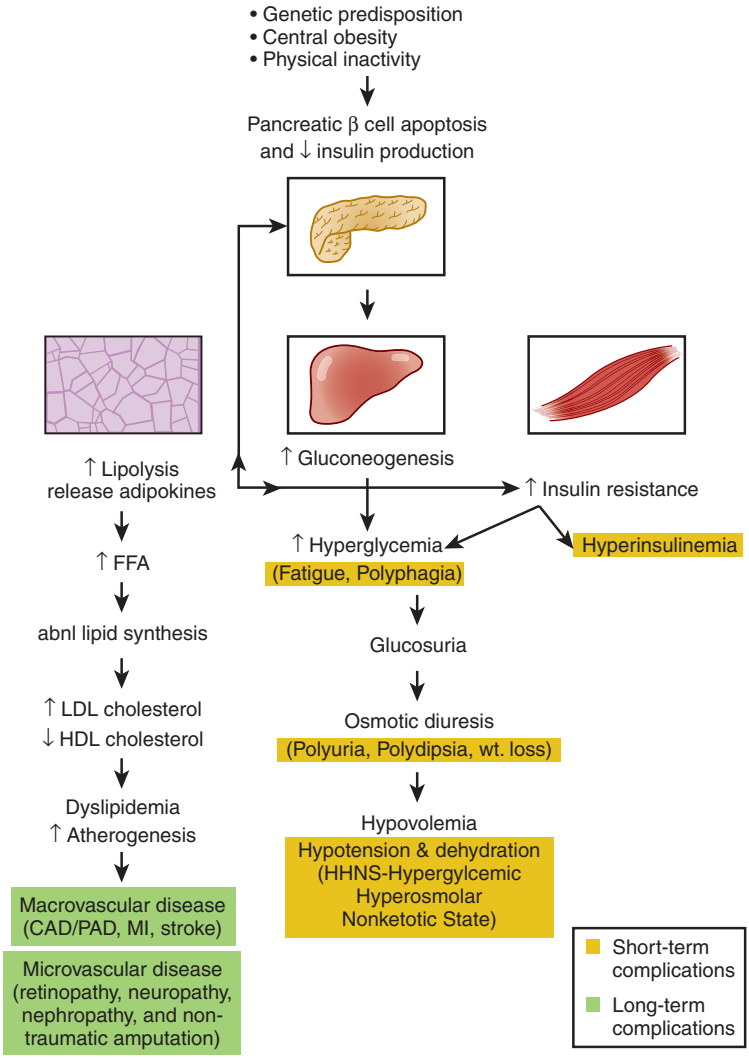


FIGURE 2-11: Pathophysiology of type 2 DM. DM = diabetes mellitus; FFA = free fatty acids; a.a. = amino acids; DKA = diabetic ketoacidosis; CAD = coronary artery disease; PAD = peripheral arterial disease; MI = myocardial infarction.

diagnostic laboratory results from abnormal fasting blood sugar (FBS) levels or abnormal oral glucose tolerance test (OGTT) results. Table 2–4 outlines the treatment of DM.

Measures of impaired glucose metabolism imply an impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Patients are not yet diagnosed with type 2 DM but are on their way to developing the disorder. Metabolic syndrome includes patients

IMPAIRED GLUCOSE METABOLISM

FBS 100–125 mg/dL
OGTT 2 hours postprandial BS 140–199 mg/dL

Table 2–4 Drug Classes for the Treatment of Diabetes Mellitus

CLASS	MOA/INDICATION	ADVERSE EFFECTS
Insulin: Short duration of Action (DOA)—Rapid Acting Lispro (Humalog) Aspart (NovoLog) Glulisine (Apidra)	Increased glucose uptake, oxidation, and storage (muscle, adipose tissue, liver) Increased amino acid uptake and protein synthesis, decreased amino acid release (muscle) Increased release of free fatty acids and increased triglyceride synthesis (adipose tissue); decreased oxidation of FFA to ketoacids (liver) Type 1, 2 DM, GDM	Hypoglycemia, hypokalemia, allergic reaction, lipodystrophy, edema
Insulin: Short DOA—Slower Acting Regular (Humilin R, Novolin R, Exubera*)	As above Type 1, 2 DM, GDM *Do not use inhaled insulin in patients with underlying lung disease	As above *Dry powder inhaler; reduced pulmonary function test (PFT) results, chronic pancreatitis (CP), dry mouth, cough, dyspnea
Insulin: Intermediate Acting Neutral protamine Hagedorn (NPH) (Novolin N, Humulin N)	As above Type 1, 2 DM, GDM	As above

Continued

Table 2–4 Drug Classes for the Treatment of Diabetes Mellitus—cont'd		
CLASS	**MOA/INDICATION**	**ADVERSE EFFECTS**
Insulin: Long Acting Detemir (Levemir), glargine (Lantus)	As above Type 1, 2 DM, GDM (Lantus)	As above
Oral Antidiabetic Agents: **Biguanide** Metformin (Glucophage)	Type 2 DM Decreased hepatic glucose production Decreased intestinal glucose absorption Increased peripheral glucose utilization (decreased resistance) Contraindicated in renal disease, metabolic acidosis, or concomitant use of IV iodinated contrast dye	Lactic acidosis in patients receiving contrast dye. Do not give 48 hours before or after dye. Does not cause hypoglycemia. Creatinine levels must be <1.5 mg/dL in men, <1.4 mg/dL in women.
Thiazolidinediones Rosiglitazone (Avandia) Pioglitazone (Actos)	Type 2 DM Decreased peripheral resistance to insulin in muscles, adipose tissue, and liver Contraindicated in active liver disease, renal impairment, and NYHA class III or IV heart failure	Monitor for CV events or deterioration of CV status, edema, weight gain, risk of fracture in women
Sulfonylureas First generation: Tolbutamide (Orinase) Second generation: Glyburide (Micronase, Diabeta), glipizide (Glucotrol) Third generation: Glimepiride (Amaryl)	Type 2 DM Stimulate endogenous insulin production by pancreas Slight decrease in insulin resistance and hepatic glucose production	Hypoglycemia, weight gain, GI upset, skin rashes

Table 2–4 Drug Classes for the Treatment of Diabetes Mellitus—cont'd

CLASS	MOA/INDICATION	ADVERSE EFFECTS
Alpha-glucosidase inhibitors Precise (Acarbose) Miglitol (Glyset)	Type 2 DM Slows the breakdown of complex carbohydrates, resulting in a decrease in postprandial blood sugar levels	Flatulence, bloating, diarrhea
Meglitinides Repaglinide (Prandin) Nateglinide (Starlix)	Type 2 DM Stimulates endogenous insulin production by pancreas; stimulates first-phase insulin release typically absent in type 2 DM patients Improves postprandial hyperglycemia Do not use in patients taking NPH insulin, elderly, malnourished, or patients with hepatic, renal, adrenal, or pituitary impairments	Hypoglycemia
DDP-4 Inhibitor Sitagliptin (Januvia)	Type 2 DM Enhances incretin system (glucoregulatory hormones released in the gut when eating; act in the brain, stomach, ileum, pancreas, liver, muscles, and adipose tissues); stimulates release of insulin from pancreas, decreases hepatic glucose production Monitor patients with hepatic and renal impairment	Nasopharyngitis, headache

Continued

Table 2–4 Drug Classes for the Treatment of Diabetes Mellitus—cont'd		
CLASS	MOA/INDICATION	ADVERSE EFFECTS
Other Injectables **Amylin mimetic** Pramlintide (Symlin)	Type 1 or 2 DM Decreases glucagon secretion, increases satiety, decreases gastric emptying, decreases endogenous glucose output from liver Not for use in patients with gastroparesis, on prokinetic drugs, or with frequent hypoglycemia or hypoglycemic unawareness	GI upset, anorexia, allergy, hypoglycemia, headache
Incretin mimetic Exenatide (Byetta)	Type 2 DM Stimulates release of insulin from pancreas, decreases glucagon secretion, increases satiety, decreases gastric emptying	Hypoglycemia, GI upset, dizziness, headache, weight loss

with IFG, IGT, abdominal obesity, HTN, and dyslipidemia. The best diagnostic examination to determine the presence of DM is the FBS test. The patient is diagnosed with diabetes when FBS is greater than or equal to 126 mg/dL on two occasions.

Short-term complications of diabetes include hypoglycemia and hyperglycemia. As hypoglycemia progresses, patients may show CNS involvement and become confused, drowsy, or combative. In its most severe form, patients may seize or lose consciousness. Death may ensue if timely treatment is not rendered or if the body's counter-regulatory hormones are not released.

Long-term complications of DM include:

- HTN
- Stroke
- Heart disease

Microvascular:

- Retinopathy
- Neuropathy
- Nephropathy
- Impotence
- Gastroparesis

S/S OF HYPOGLYCEMIA

The S/S correspond with the unavailability of blood sugar to meet the body's needs and the release of adrenaline and other counter-regulatory hormones: weakness, tremor, tachycardia, hunger, and diaphoresis.

Review the pathophysiology of type 1 DM, type 2 DM, and prediabetes or metabolic syndrome in Figures 2–10, 2–11, and 2–12. When you understand the pathophysiological mechanisms of these disorders, you can better explain the S/S and treatment plans to your patients and their families. When you are articulate about prediabetes, you also may present a more compelling case for adherence to lifestyle modifications. Moreover, you may recognize early S/S of short-term and long-term complications of these disorders and prevent serious sequelae. You will have the power to make a difference in the lives of your patients by promoting health and preventing disease.

In addition, you can help patients understand the importance of tight glucose control. To determine best evidence for practice, the Diabetes Complications and Control Trial and the United Kingdom Prospective Diabetes Study examined and supported tight glucose control in the type 1 and type 2 DM patient. Two important current studies to track and explain to your patients are:

- Diabetes Reduction Assessment with Ramipril and Rosiglitazone Medications (DREAM)
- Diabetes Prevention Program (DPP)

Pharmacology and DM

Patients with DM are treated with lifestyle modifications and medications. Lifestyle modifications consist of medical nutrition therapy (MNT), exercise,

PEAK PERFORMANCE: SMBG

Take action to teach patients self-monitoring of blood glucose (SMBG) levels:

1. Gather equipment (lancet, machine, glucose strips, sharps container).
2. Wash hands before and after pricking finger.
3. Calibrate the machine according to the procedure recommended by the manufacturer.
4. Use the procedure that is recommended by the manufacturer.
5. Record blood glucose result on your SMBG record.

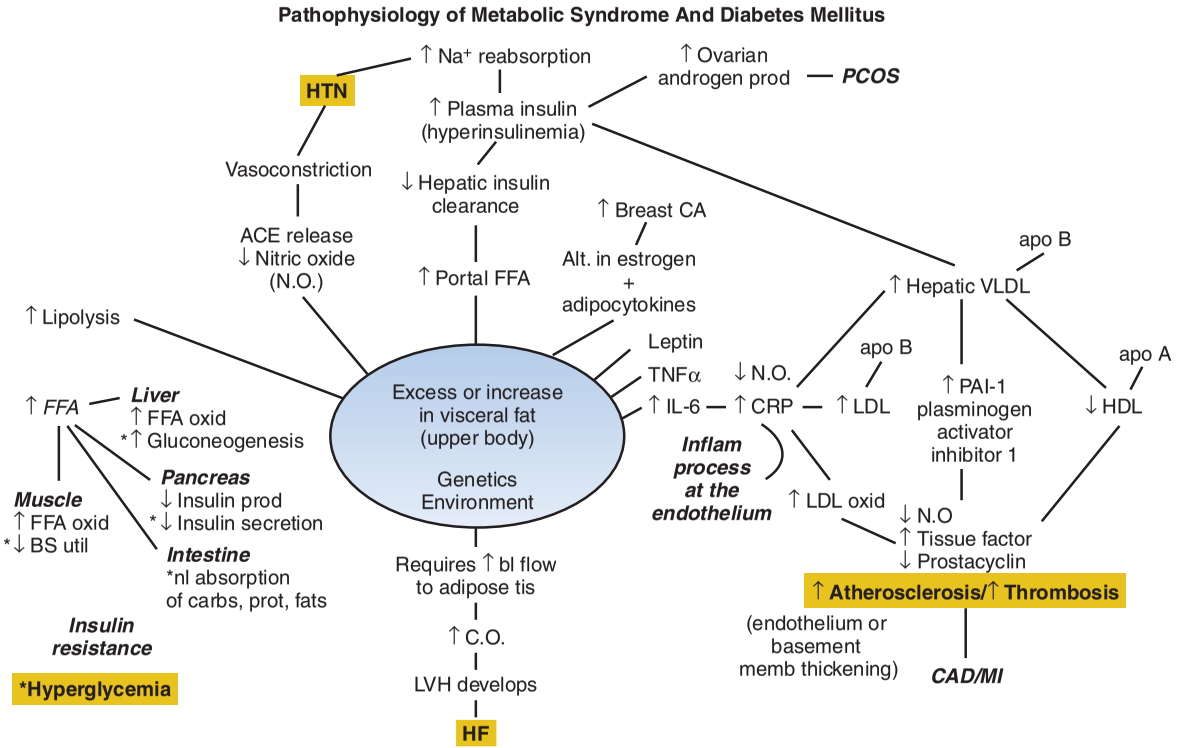


FIGURE 2-12: Pathophysiology of metabolic syndrome and DM.

and weight loss. Medications used to treat the various types of DM are listed in Table 2–4.

Desired Outcomes for Patients With DM

Increase your overall understanding of DM with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Patient/family will verbalize key components of the pathophysiological process of DM, the therapeutic regimen, and the proposed treatment plan.
- Patient/family will describe self-care measures to prevent progression of the disease and S/S of its complications.
- Patient will maintain a balance of nutrition, activity, and insulin availability to promote normal or near-normal BS levels, activity levels, and optimum weight.
- Patient will not experience injury from hypoglycemic events, hyperglycemia, diminished sensation and circulation to the feet, retinopathy, neuropathy, or renal insufficiency.

P—Purpose

- Provide the best evidence-based care for patients with DM

E—Evidence

- ADA: 2008 Clinical Practice Recommendations

A—Action

- Assess the patient with DM by asking pertinent subjective and objective data: recent excess thirst, hunger, or urination; fatigue, weight loss, family history of DM; blurred vision, S/S dehydration, changes to skin pigmentation, or slowed wound healing.
- Educate your patient regarding risk factors for prediabetes and DM: obesity, inactivity, age, ethnicity, genetic predisposition.
- Educate your patient in the skill of SMBG and how to record results.
- Explain diagnostic results to the patient with DM (FBS, hemoglobin A1c, 2-hour postprandial blood glucose) and related tests such as cholesterol levels, triglyceride levels, and ECG findings.
- Review general recommendations for medical nutritional therapy (MNT): moderate weight loss as needed; regular physical exercise; reduced calories; reduced intake of fats; high fiber and whole grain foods. *Note:* Currently not sufficient evidence to recommend low-glycemic load foods.
- Complete psychosocial assessment and care.
- Educate the patient/family to recognize S/S of hypoglycemia and how to treat it with oral glucose (15–20 g) or glucagon.

- Explain the need to treat with antidiabetic medications and any additional prescriptions for BP control, lipid management, and antiplatelet therapy. Monitor for short-term and long-term complications of DM.
- Educate the patient/family about additional requirements of sick-day care.

K—Knowledge

- How a patient is diagnosed with DM
- Diagnostic tests used to diagnose and monitor DM
- How to instruct the patient in the proper technique for completing SMBG
- Pathophysiology of various types of DM
- Clinical manifestation of various types of DM
- Medical nutrition therapy
- Exercise and weight reduction
- Sick-day care of the patient with DM
- S/S and treatment of short-term and long-term complications of DM
- Foot care and prevention of slowed wound healing and amputation
- Eye care of the patient with DM

CLINICAL VOICE: DM IN THE COMMUNITY

Mr. Jones had type 2 DM that required insulin to control his blood glucose levels. His fingerstick blood glucose level was 560 mg/dL, and he complained of blurred vision. A homeless man, he had not been taking his insulin because it had been too hot during the summer to store insulin and he had no way of keeping it refrigerated or between 37°F and 85°F. Patients like Mr. Jones need not only more education but also community-based support to facilitate adhering to their treatment plan. A nearby shelter provided Mr. Jones with a cooler.

Ms. Smith had type 1 DM. She often experienced the Somogyi phenomenon, which occurs with too much insulin or too little food at supper or bedtime. Subsequently, the patient experiences hypoglycemia between 2 a.m. and 3 a.m. due to a drop in blood glucose levels. When Ms. Smith's BS dropped during the night, her dog would whine and lick her face until she woke up. Ms. Smith believed changes in her skin and breathing caused the dog to react in this way. Then Ms. Smith would complete SMBG and treat her hypoglycemia. She credits her dog with saving her life many times.

Glaucoma

Glaucoma refers to a number of disorders that result in ischemia and damage to the retina and optic nerve. If treatment is not initiated, vision loss and complete blindness may result. The most common forms of glaucoma are primary open-angle glaucoma and acute angle closure glaucoma. These disorders have no cure, but reducing intraocular pressure (IOP) slows or stops their progression.

Aqueous humor maintains normal IOP and supports metabolism of the lens and posterior cornea. Formation and secretion of aqueous humor begin at the ciliary body of the posterior chamber. Aqueous humor then flows through the pupil to the anterior chamber. Resorption occurs through the trabecular mesh into the canal of Schlemm, with return by way of the venous system. If flow is obstructed at the trabecular meshwork and resorption into the venous system is blocked, the IOP rises in both the anterior and posterior chambers (Fig. 2–13).

Eye specialists visualize and measure the angle of the anterior chamber by means of gonioscopy to differentiate open- from closed-angle glaucoma. Primary angle closure glaucoma:

- Occurs bilaterally.
- Occurs with increased frequency in ages >60 years.
- Creates insidious S/S such as tunnel vision, dull eye pain, halo/blurred vision, and decreased color perception.
- Results in IOP >20 mm Hg measured by tonometry.

Nurses can grossly evaluate the pressure in a patient's eye:

- Ask the patient to close both eyes.
- Gently palpate the orbit of the unaffectedeye through the patient's closed eyelid.
- Gently palpate the orbit of the affected eye, again through the patient's closed eyelid.
- Make an assessment: with elevated IOP the orbit will feel very firm on palpation.

Acute angle closure glaucoma is a sight-threatening emergency. Physical narrowing of the angle between the pupil and lateral cornea impairs the outflow of the aqueous humor through the trabecular meshwork and canal of

EVIDENCE FOR PRACTICE

Normal IOP = 12–20 mm Hg measured using a tonometer.

Aqueous humor, produced by the eye's ciliary bodies, is blocked from its normal outflow routes and results in an increase in the IOP.

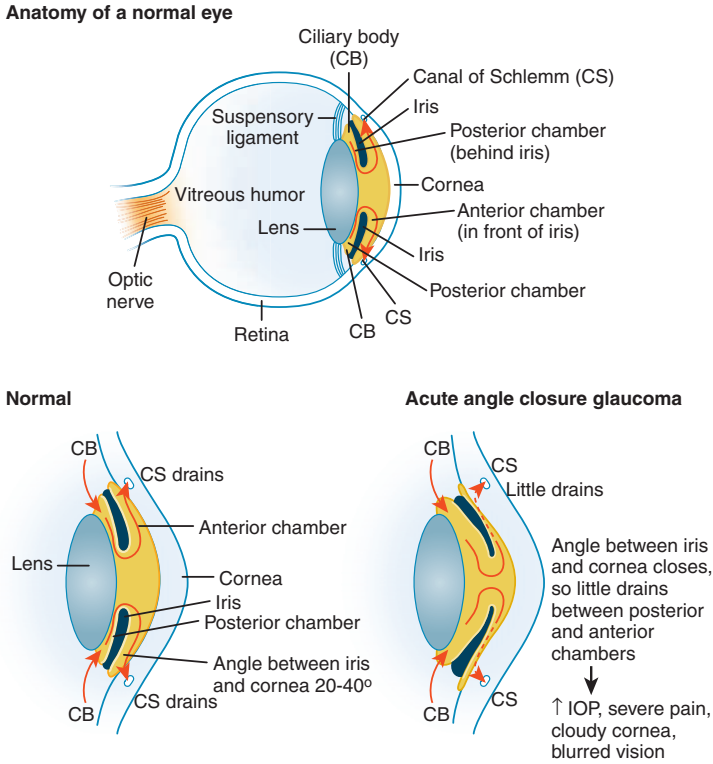
Elevated IOP may cause progressive damage to the optic nerve.

RISK FACTORS FOR GLAUCOMA

Advancing age
Positive family history of glaucoma
African American
Elevated IOP

Schlemm and into the venous system, which leads to elevated IOP. Acute angle closure glaucoma:

- Occurs unilaterally
- Occurs with increased frequency with increased age
- Causes acute sudden onset of severe eye pain, severe headache, nausea and vomiting due to deep visceral pain, blurred vision and colored halos around lights, conjunctival erythema (redness of the eye), haziness or steamy



Cross-section comparing the anatomy of a normal eye with that of acute angle-closure glaucoma

FIGURE 2-13: Glaucoma.

appearance to the cornea, dilated pupil, nonreactivity to light, loss of peripheral vision, nonreactive dilated pupil
- Is precipitated by prolonged pupil dilation (darkness) and emotional distress
- Results in IOP >20 mm Hg measured by tonometry

Pharmacology and Glaucoma

Glaucoma is a chronic disorder requiring long-term care. Whether insidious or acute visual disturbances occur, both may result in visual impairment and disruption of activities of daily living (ADLs). NCLEX-RN topics regarding the eye are in Box 2–6. Drug classes used to lower IOP include (Table 2–5):

- Alpha$_2$ agonists
- Beta blockers
- Prostaglandin analogs
- Cholinergic agonists
- Cholinesterase inhibitors
- Drug classes for treatment of other eye disorders are in Table 2–6

COACH CONSULT

Mydriatics dilate pupils. Both words contain the letter "d."

Miotics constrict pupils. Both words contain the letters "t" and "c."

CLINICAL VOICE: GLAUCOMA IN THE COMMUNITY

After Mrs. Wilson learned about the S/S of acute angle closure glaucoma, she never traveled outside her hometown to visit her grandchildren. She was afraid to have an acute glaucoma attack and not be able to get to her eye doctor. Her family nurse practitioner knew how much she enjoyed visiting her grandchildren and asked for Mrs. Wilson's interpretation of her disease. When the nurse practitioner explained that Mrs. Wilson could receive treatment at most emergency departments or hospitals in most metropolitan areas, Mrs. Wilson heaved a sigh of relief and went home to make travel plans.

Box 2–6 NCLEX-RN Topics and Medications Regarding the Eye

- Blindness, causes of
- Cataracts
- Glaucoma, Primary Open Angle or Acute Angle Closure
- Retinal detachment
- Myopia
- Hyperopia
- Presbyopia

Table 2–5 Drug Classes for the Treatment of Glaucoma

CLASS	MOA	ADVERSE EFFECTS
Alpha$_2$ Agonists Brimonidine or suffix "nidine"	Decrease aqueous humor production	Headache, dry mouth/nose, altered taste, conjunctivitis, eyelid reactions, pruritis
Beta Blockers Timolol; selective/ nonselective	Decrease aqueous humor production	Heart block, bradycardia, bronchospasm
Prostaglandin Analogs Latanoprost or suffix "prost"	Decrease aqueous humor outflow	Hyperpigmentation of iris and lid (brown)
Cholinergic Agonists Pilocarpine	Increase aqueous humor outflow	Miosis (papillary constriction), blurred vision; systemic parasympathetic nervous system (PSNS) responses
Cholinesterase Inhibitor Echothiophate	Increase aqueous humor outflow	Miosis, blurred vision; systemic PSNS responses
Carbonic Anhydrase Inhibitors: Brinzolamide	Decrease aqueous humor production	Stinging, bitter taste, conjunctivitis, eyelid reactions

Table 2–6 Drug Classes for the Treatment of Other Eye Disorders

CLASS	INDICATION	MOA	ADVERSE EFFECTS
Cycloplegics	Diagnosis of ocular disorders; facilitate ophthalmic surgery; treatment of anterior uveitis	Muscarinic antagonist; paralyze ciliary muscle	Anticholinergic photophobia, blurred vision, dry mouth; precipitate acute angle closure glaucoma
Mydriatics	Diagnosis of ocular disorders; facilitate ophthalmic surgery	Muscarinic antagonist; dilate pupil	Anticholinergic photophobia, blurred vision, dry mouth; precipitate acute angle closure glaucoma

Table 2–6 Drug Classes for the Treatment of Other Eye Disorders—cont'd

CLASS	INDICATION	MOA	ADVERSE EFFECTS
Artificial tears	Dry eye syndrome	Lubricate eye; substitute for natural tears	None
Ocular decongestants	Red, irritated eye	Weak adrenergic agonists that constrict dilated conjunctival blood vessels	Stinging, reactive hyperemia
Glucocorticoids	Treatment of inflammatory disorders of the eye (uveitis, iritis, conjunctivitis)	Halt inflammatory response by inhibiting PG, LT, and thromboxane production	Long-term use: Cataracts, glaucoma, infections, decreased visual acuity, increased IOP
Mast-cell stabilizers Cromolyn	Allergic conjunctivitis	Halt inflammatory response by preventing release of inflammatory mediators	Long-term use: Cataracts, glaucoma, infections, decreased visual acuity, increased IOP
H_1 Receptor Blockers Emedastine difumarate	Allergic conjunctivitis	Halt inflammatory response by preventing release of inflammatory mediators	Long-term use: Cataracts, glaucoma, infections, decreased visual acuity, increased IOP
NSAIDs Ketorolac	Allergic conjunctivitis	Halt inflammatory response by preventing release of inflammatory mediators	Long-term use: Cataracts, glaucoma, infections, decreased visual acuity, increased IOP
Angiogenesis inhibitor Pegaptanib	Wet age-related macular degeneration	Antagonist of vascular endothelial growth factor	Endophthalmitis, blurred vision, cataracts, conjunctival hemorrhage

Continued

Table 2–6 Drug Classes for the Treatment of Other Eye Disorders—cont'd			
CLASS	INDICATION	MOA	ADVERSE EFFECTS
Dyes Fluoroscein	Detect lesions of the corneal epithelium	Defects of the cornea outlines by stain	Rare
Antiviral agents Ganciclovir	Viral eye infections	Inhibits DNA synthesis	Systemic: Granulocytopenia and thrombocytopenia; teratogenic

Desired Outcomes for Patients With Glaucoma

Increase your overall understanding of glaucoma with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Patient will prevent progression of damage to the optic nerve and retina by seeking timely and appropriate health care.
- Patient will perform health-promoting activities to prevent injury related to visual field deficits.
- Patient will understand pain management related to the pathophysiological process of the disorder and/or surgical correction of the disorder.
- Patient will safely complete all self-care and medication administration (eyedrops).

P—Purpose

- Care for the patient suffering from a chronic visual impairment or a sight-threatening emergency

E—Evidence

- Clinical Guideline: *Care of the patient with open angle glaucoma,* 2nd ed., American Optometric Association (first developed 2002; reviewed biannually and considered the current guideline)

A—Action

- Understand the pathophysiology of glaucoma and its prevalence in the community.
- Obtain baseline data and follow over time: patient history, visual acuity, pupil assessment, S/S of elevated IOP (visual acuity/visual fields, pupil assessment, tonometry, gonioscopy, tomography),

administer medications ordered to decrease IOP or amount of aqueous humor produced: mitotic agents, alpha$_2$ agonists, beta blockers, prostaglandin analogs, cholinesterase inhibitors, carbonic anhydrase inhibitors.
- Teach patients/family the need to take medications daily for life, actions and side effects of the medications, proper administration of eyedrops, and to check with their primary health-care provider before starting any over-the-counter (OTC) medications, which may adversely interact with some eyedrops.
- Provide preoperative/postoperative care of the patient who undergoes a laser trabeculoplasty, trabeculostomy, iridectomy, or laser iridotomy.
- Teach patients/family health promotion, including going for early detection of glaucoma through annual eye examinations (after age 40 years), wearing a medic alert bracelet, and instituting safety precautions to compensate for reduced visual acuity.

K—Knowledge
- Assessment of the patient
- Treatment and management of open-angle or closed-angle glaucoma
- Increased risk for drug-drug interactions, even from eyedrops, for geriatric patients with other systemic illnesses

Preeclampsia

Preeclampsia is a complex disorder of pregnancy. It occurs after the 20th week of gestation and affects many of the woman's body systems. If preeclampsia is not managed, it may harm the fetus and the mother. Management depends on the gestational age of the fetus as well as the severity of S/S. The following classes of medications are used to treat preeclampsia: antihypertensives, prophylactic antiseizure drugs, and vitamins. Table 2–7 lists medications used to treat preeclampsia. The definitive intervention for severe preeclampsia is delivery of the fetus. Nonpharmacological interventions include:
- Bedrest
- Intake and outputs (I&Os)
- Monitoring BP
- Monitoring weight daily
- Neurological status
- DTRs (watch for hyperreflexia and clonus)

Table 2–7 Drug Classes for the Treatment of Preeclampsia			
CLASS	INDICATION	MOA	ADVERSE EFFECTS
Antihypertensives Chronic: Any except ACEs or ARBs New diagnosis: Methyldopa	BP >140/>90 mm Hg Chronic HTN Pregnancy-induced HTN	Depends on class Acts as an indirect antiadrenergic agent in the CNS	Depends on class Positive Coomb's test and/or hemolytic anemia (monitor with complete blood count [CBC])
Antiseizure: Magnesium sulfate ($MgSO_4$)	Prevents or controls seizures during eclampsia or preeclampsia	Stops the propagation of nerve impulses by decreasing acetylcholine (neurotransmitter) at the neuromuscular junctions (peripheral); reduces vasospasm of intracerebral vessels	Mg toxicity: flushing, sweating, hypotension, depressed deep tendon reflexes (DTRs) or CNS
$MgSO_4$ antidote Calcium gluconate	Mg toxicity: Flushing, sweating, hypotension, depressed DTRs or CNS	Opens calcium channels blocked by Mg to allow for impulse transmission in nerves	Hypotension and asystole with rapid administration; depressed DTRs and depressed neuromuscular transmission of skeletal muscle contraction

- Laboratory tests (CBC, liver function tests [LFTs], electrolytes for hemolytic anemia, elevated liver enzymes, and low platelet count [HELLP] syndrome)

Desired Outcomes for Patients With Preeclampsia

Increase your overall understanding of preeclampsia with our PEAK mnemonic to summarize the nursing process, use best evidence, and promote the following desired outcomes:

- Patient understands the importance of prenatal care and associated diagnostic tests.

- Patient will follow individualized plan of care by maintaining bedrest, maintaining adequate fluid intake, eating a diet low in salt and high in proteins and carbohydrates, and taking prescribed antihypertensive medications or magnesium sulfate.
- Patient and/or family will develop self-assessment skills to notify the nurse of S/S of magnesium toxicity (flushing, sweating, confusion).
- Patient will not progress in S/S to eclampsia (see Alert).
- Patient will deliver a healthy infant without complications to either the infant or the patient.

ALERT

Preeclampsia and eclampsia are the second leading causes of pregnancy-related death (after ectopic pregnancy). Risks of preeclampsia to the fetus are intrauterine growth retardation (IUGR), premature birth, and death. Risks to the mother, in its most severe form (eclampsia), are seizures (before or after delivery of the newborn), renal failure, pulmonary edema, and death.

Preeclampsia is characterized by:

- Elevated BP (>140/>90 mm Hg)
- Proteinuria (>300 mg in 24 hours)
- Swelling, which may occur and is more serious when it does not resolve after resting, is very obvious in the patient's face and hands, and is associated with rapid weight gain of more than 5 pounds in a week
- Oliguria or anuria
- Hematuria
- Severe headaches
- Hematemesis
- Tachycardia
- Dizziness
- N/V
- Tinnitus
- Drowsiness
- Fever
- Diplopia, blurred vision, sudden blindness
- Abdominal pain

Preeclampsia used to be called "toxemia" because it was thought to be caused by a toxin in a pregnant woman's bloodstream. Although bench scientists have refuted this theory, the actual cause of preeclampsia has not been determined. Injury to the vascular endothelium and resulting dysfunction may be to blame, not only for HTN but also for alterations in

the clotting cascade and involvement of multiple organ systems (Fig 2–14). Other possible causes include:

- Imbalance between prostacyclin and thromboxane (elements of the clotting cascade)
- Autoimmune disorders
- Insufficient blood flow to the uterus and placenta

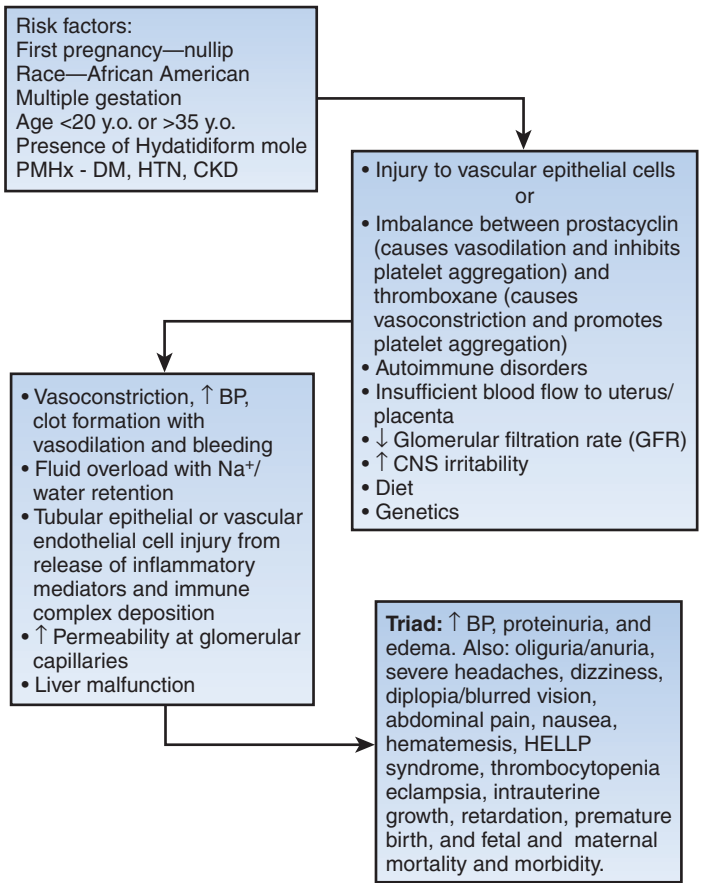


FIGURE 2-14: Possible pathophysiology of preeclampsia.

- Decreased glomerular filtration rate with sodium and water retention
- Increased CNS irritability
- Diet
- Genetics

The pathophysiological results of preeclampsia or eclampsia depend on the severity of the disorder. Patients may experience any or all of the following pathological processes:

- Hypertensive encephalopathy
- Intracranial bleeds
- Seizures (eclampsia)
- Retinal detachment
- Pulmonary edema
- Vasoconstriction
- Liver involvement producing HELLP syndrome
- Liver involvement producing hepatic infarction
- Swelling of the glomerulus with a decreased glomerular filtration rate (GFR)
- Normal-to-abnormal clotting factors

Preeclampsia occurs in a small percentage of pregnancies. Risk factors include:

- African-American race
- First pregnancy: nulliparous
- Multiple gestation
- Younger than age 20 or older than age 35 years
- Hydatidiform mole
- Polyhydramnios
- Past history of diabetes, high BP, or kidney disease

Treatment and management of the mother and fetus depend on the severity of the disorder, the gestational age of the fetus, and complications as they develop in the mother and fetus. For mild preeclampsia:

- Put the patient on bedrest, at home or in the hospital.
- Assess BP.
- Perform urine dipstick for proteinuria.
- Assess for S/S common to the disorder.
- Anticipate antihypertensive agents if diastolic blood pressure (DBP) >100 mm Hg and the fetus is less than or equal to 30 weeks gestational age.

Nonstress testing of the status of the fetus is done two times per week. If the mother's S/S worsen, continuous fetal monitoring will be required until

the fetus is delivered. Amniocentesis to assess the lecithin:sphingomyelin (L:S) ratio is not always completed, but if delivery is imminent a dose of corticosteroids may be given to accelerate the maturity of the fetal lung tissue. In severe cases of preeclampsia the goal is to prevent seizures in the mother, control maternal BP, and deliver the infant.

Nearly 75% of all eclamptic seizures occur prior to delivering the baby. Therefore, nurses assess for clonus, DTRs, and seizures in pregnant women with preeclampsia. These assessments provide information about the extent of irritation in the peripheral or central nervous system, which may be a precursor to the patient developing eclampsia. Clonus and DTRs may be responses to a decrease in magnesium, allowing an increase in acetylcholine at the neuromuscular junctions. It is not as well determined how magnesium works in the CNS, but it may produce vasodilation in the small intracerebral vessels, reversing cerebral ischemia caused by vasospasms. Of note, about 50% of postpartum eclamptic seizures occur in the first 48 hours after delivery. They may even occur up to 6 weeks after the baby is delivered.

Indications for delivery in patients with preeclampsia:

- DBP consistently >100 mm Hg over 24 hours
- Rising serum creatinine level
- Persistent or severe headache
- Epigastric pain
- Abnormal LFTs
- Thrombocytopenia
- HELLP syndrome
- Eclampsia
- Pulmonary edema

PEAK PERFORMANCE BOX: TEST YOUR PATIENT FOR DTRs AND CLONUS

1. Use the rubber percussion hammer to tap the slightly stretched tendon briskly. To refresh your memory about how to find the tendons, refer to your health assessment book.
2. Assess the biceps, triceps, brachioradialis, patellar, and Achilles reflexes. Document your findings using the grading scale from 0 (absent reflex), to 4+ (hyperactive reflex with clonus or rhythmic jerking movements of the limb). "Normal" on the grading scale = 2+.
3. To assess your pregnant patient easily for clonus, support the lower extremity and the foot. Quickly dorsiflex the foot (point the toes to the patient's nose). Watch for rhythmic, involuntary contractions at the ankle and foot. If present, grade the ankle (Achilles) reflex as 4+.

- Abnormal fetal HR testing
- Small for gestational age (SGA) fetus with failure to grow on serial U.S. examinations

Pharmacology and Preeclampsia

Box 2–7 shows important NCLEX-RN topics related to preeclampsia and risks during pregnancy.

Dimensional Analysis in Medication Calculation

IVs/IV Pumps/Drop Factors

Here we present the emerging technique of dimensional analysis (DA) for drug calculations. This one approach works regardless of the type of calculation the nurse must perform. DA replaces excuses like, "I just am no good at math," with self-efficacy and confidence.

Box 2–7 NCLEX-RN Topics on Preeclampsia and Risks During Pregnancy

- Abortion
- HIV/AIDS
- Anemia
- Heart disease
- Chorioamnionitis
- DM
- Disseminated intravascular coagulation (DIC)
- Ectopic pregnancy
- Endometritis
- Fetal death in utero
- HELLP syndrome
- Hepatitis B
- Hematoma
- Hydatidiform mole
- Hyperemesis gravidarum
- Chronic HTN with superimposed pregnancy-induced HTN
- Pregnancy-induced HTN (preeclampsia, eclampsia)
- Incompetent cervix
- Infection
- Multiple gestation
- Sexually transmitted diseases
- Urinary tract infections

Many of today's college students learned DA during high school and cannot imagine mastering multiple, cumbersome ways of old. More compelling, however, are issues of patient safety. With mounting evidence that DA increases accuracy and patient safety, place yourself on the cutting edge of nursing practice through its mastery. Second-year nursing students who were taught DA, rather than traditional math, scored better on a test of medication dosage calculation.

Safe medication administration requires more than rote knowledge of five, six, or even seven "rights." Wilkinson and Van Leuven, experts on the fundamentals of nursing, recommend a systematic 14-step procedure to follow for the administration of all medications, regardless of type or route. Their method requires:

- A triple check of critical safety elements
- Adherence to agency policies
- Knowledge of medications
- Knowledge of related patient factors, such as age and weight

Before you give an IV medication, note particularly any drug-drug interactions and the rate of administration. IV-push medications are typically delivered in fewer than 5 minutes. IV pumps administer medications over minutes to hours, intermittently, or continuously. Pumps administer medications as milliliters (mL) per hour.

Steps in Dimensional Analysis

1. GIVEN: beginning, what you start with, what is on hand
2. WANTED: answer, end with, what you will administer
3. PATH: use conversion factors you have learned or can look up to go from GIVEN to WANTED
4. COMPLETE CONVERSION PATH: cancel unwanted units and keep WANTED units for answer
5. COMPUTE or CALCULATE (multiply or divide): get the WANTED answer

Example 1

Physician's order: Heparin 1500 units/hr IV

1. GIVEN = Heparin 25,000 units in 250 mL D_5W
2. WANTED = 1500 units/hr
3. PATH = $\frac{\text{units}}{\text{hr}} \times \frac{\text{mL}}{\text{units}} = \frac{\text{mL}}{\text{hr}}$
4. CONVERSION PATH = $\frac{1500 \text{ units}}{\text{hr}} \times \frac{250 \text{ mL}}{25{,}000 \text{ units}} = \frac{\text{mL}}{\text{hr}}$
5. CALCULATE = $1500 \times 250/25{,}000 = 15$ mL/hr

Example 2

Physician's order: 500 mL 0.45% NS with 20 mEq KCl over 8 hours

1. GIVEN = 500 mL/8 hours
2. WANTED = mL/hr
3. PATH = Have what is wanted
4. CONVERSION PATH = $\frac{500 \text{ mL}}{8 \text{ hr}}$
5. CALCULATE = 63 mL/hr

Example 3

Physician's order: Aminophylline 44 mg/hr IV pump

1. GIVEN = Aminophylline 44 mg/hr IV pump
2. WANTED = mL/hr
3. PATH = Given × Dose on Hand $\frac{\text{(Aminophylline 1 g)}}{250 \text{ mL NS}}$
4. CONVERSION = $\frac{44 \text{ mg}}{\text{hr}} \times \frac{250 \text{ mL}}{1 \text{ g}} \times \frac{1\text{g}}{1000 \text{ mg}}$
5. CALCULATE = $\frac{44 \times 25}{100}$ = 11 mL/hr

Example 4

Physician's order 250 mL NS over 30 min; drop factor 10 gtt/mL

1. GIVEN = 250 mL/30 min
2. WANTED = gtt/min
3. PATH = gtt per mL
4. CONVERSION = $\frac{250 \text{ mL}}{30 \text{ min}} \times \frac{10 \text{ gtt}}{\text{mL}}$
5. CALCULATE = $\frac{250}{3}$ = 83.3 gtt/min

PEAK PERFORMANCE: MASTERY OF DA

Perform DAs on the practice pages until you master the approach. Then teach a peer or a preceptor. Would you like to be regarded as a potential staff nurse at a particular hospital or agency? DA makes an outstanding in-service topic during a clinical rotation. Track recommendations of accrediting bodies and other safety initiatives for DA's anticipated emergence as the preferred method of calculating dosages:

- The Joint Commission's National Patient Safety Goals: Goal 3 relates to medication safety (http://www.jointcommission.org/PatientSafety/)
- Quality and Safety Education for Nurses (QSEN) Initiative: Safety is one of the identified competencies (www.qsen.org)

CHAPTER 3

Physical Assessment Skills and Findings: Firming the Foundation of the Nursing Process

As the initial step in the nursing process, assessment of a patient is critical. It is ongoing and may occur every few minutes for a critical patient or every few hours for those less acutely ill. Reassessment is a part of evaluation that helps determine the effectiveness of nursing interventions. This chapter accelerates your mastery of assessment with easy-to-reference tables and mnemonics that facilitate a systematic approach. The chapter also includes essential information for a thorough pain assessment. Your patients depend on you not only to address their pain but also to give voice to their individual cultural and developmental factors related to pain.

Assessment comprises two main areas of data collection: subjective and objective. The nurse obtains subjective data by asking questions of the patient or responsible person in an efficient manner. The nurse gathers objective data primarily with a physical examination. Other types of objective patient data may include monitor readings (e.g., vital signs), laboratory test results, and radiological findings. The following section presents each type of data collection with accompanying tables.

Subjective Assessment

The nurse obtains subjective history by *talking* with the patient, the patient's family, or, when necessary, the patient's friends. It is important to note that Health Insurance Portability and Accountability Act (HIPAA) guidelines require permission from patients to discuss their health history with family and friends. The responses the nurse receives may be valid, but subjective data can also be incomplete, inaccurate, or false. Subjective history gathering should help *focus* the nurse's physical assessment by identifying specific complaints and associated symptoms. The less experienced nurse often obtains the subjective history and then does a physical examination. As the nurse becomes more efficient, the subjective history questioning and the physical examination may occur simultaneously.

CLINICAL VOICE: THE VALUE OF SUBJECTIVE DATA

As you become more experienced, it might seem as if your increasingly capable physical examination could and should take precedence over subjective data. Resist this temptation, and value both kinds of data. For unexpected conditions, whenever possible, gather subjective data before a physical examination. This order of events provides a second opportunity to confirm or refute related subjective history. For example, a 30-year-old man presented with a painful, discolored thumb. At first, he denied knowledge of the cause and asked only for pain relief. When the nurse pressed for additional data, the patient said, "I think I hit it with a hammer the other day." Murky subjective data raised the nurse's index of suspicion and prompted a thorough physical examination. The nurse spotted a small puncture near the base of the thumb. When confronted with this finding, the patient admitted he had self-injected cocaine. The nurse surmised that he missed the vein. Indeed, a clot had formed in the principal artery of the thumb. Corrective surgery followed immediately, saving the patient's thumb from amputation. The information gathered from these essential assessment activities leads the nurse to form an idea of a patient's health. It is critical to reassess frequently, especially when there is a change in patient status (see "When to Call the Physician" in Chapter 8).

Table 3–1 uses an easy-to-remember alphabetical mnemonic to help the nurse complete an organized and thorough subjective history. Each part of the list does not "work" for every patient complaint or symptom. Adapt the list as needed for an individual patient's condition. For illustration, the third column in the table lists sample responses from a patient presenting with acute abdominal pain. Start your subjective history gathering by asking the

Table 3–1 Alphabetical Mnemonic for Subjective History Gathering

Chief Complaint		What is wrong?	"I have a pain in my belly."
Letter	**Topic**	**Questions**	**Sample Responses**
L	*L*ocation	Can you point to where the pain is?	Patient points to right lower quadrant.
M	*M*echanism	What do you think is causing your pain?	"I don't know; maybe something I ate last night?"
N	*N*ew	Is this a new problem for you? Is this something you've ever had before?	"I've never had a problem like this."
O	*O*nset	When did your pain start?	"Last night at 11 p.m."
P	*P*alliative *P*rovocative	What makes your pain better? What makes your pain worse?	"Nothing; I took some acetaminophen, and it didn't help." "Bouncing in the car and lying flat seem to make it worse."
Q	*Q*uality	Can you describe the pain?	"It's mostly achy, but it is sharp at times."
R	*R*adiation	Does you pain seem to go to other parts of your body?	"It hurts a little near my belly button."
S	Severity Setting	On a scale of 1–10, what is your pain right now? What is it at its worst? Does your pain seem to occur when you are in a specific place or doing something specific?	"It is about 7 out of 10." "It feels like a 9 sometimes." "No; it hurts all the time and everywhere."
T	*T*iming	Has your pain changed over time?	"It is a little worse at times, but it is always there."

Continued

Table 3–1 Alphabetical Mnemonic for Subjective History Gathering—cont'd			
U	*U*nusual symptoms	Are you having any other unusual symptoms? Do these seem related to your pain?	"I've been sick to my stomach and threw up once. I also feel warm."
V	*V*alid	Do these symptoms seem real to you? (Try to determine if the complaint may be psychosomatic. Evaluate if dementia or delirium may be affecting subjective responses.)	"Yes, I don't know what's going on."
W	*W*ork	Have your symptoms prevented you from work, school, ADLs?	"I stayed home from work today and don't feel like doing much."

patient his or her chief complaint, which is often abbreviated "cc," or "reason for being seen." Document what the patient says as a direct quotation. If the patient mentions other major complaints, screen each complaint separately using the same history-gathering questions. A full patient assessment includes the patient's past medical history, medication and supplementation history, allergies, family history, and psychosocial history. Box 3–1 lists key questions nurses should use when assessing a patient's mental health.

Physical Assessment

The physical assessment of the patient should be *relevant* and *focused*. In nursing school, students typically learn an array of assessment skills that are not routine or are used infrequently. Based on the patient's diagnosis and subjective complaints, it is important for the nurse to decide which aspects of the physical examination to assess. Developing *efficient* and *thorough* assessment skills is critical in today's fast-paced health-care delivery systems.

The nurse should do an initial assessment at the beginning of the work shift to develop a baseline with which to compare later assessments (Box 3–2): it is *vital* to monitor your patient's *vital signs.* Box 3–2

Box 3–1 Psychosocial Vital Signs: Assessment of Psychosocial Variables

Mental Health Nurse Educator Charlotte Spade offers a "cut-to-the-chase" approach for a systematic assessment of essential psychosocial variables:

- *Perception:* The nurse asks, "What is happening?" The nurse probes, "What are your thoughts about this situation?" The nurse asks, "On a scale from 0 to 10, how would you rate this whole situation, with 0 as positive and 10 as negative?"
- *Support:* The nurse asks, "Who is someone you can depend on being here to support you in this situation?" The nurse asks, "On a scale from 0 to 10, how would you scale your sense of support, with 0 as everyone you need and 10 as no one?"
- *Coping:* The nurse asks, "How are you dealing with this situation?" The nurse probes, "What are you doing that helps?" The nurse asks, "On a scale from 0 to 10, how would you scale this situation, with 0 as the easiest and 10 as the most difficult thing in life?"
- *Anxiety:* The nurse asks, "How do you feel about this situation?" The nurse probes, "How is this situation affecting you?" The nurse asks, "On a scale from 0 to 10, how would you scale your feeling about this situation, with 0 as calm and 10 as terrified?"

Scores are created for each variable and added to give a psychosocial vital sign (PVS), which guides the remaining steps of the nursing process, including effective nurse communication.

Box 3–2 ABC "Quick Look" Baseline Assessment

Get systematic! Assess A to E on entering the room:

A: Airway, alertness (AVPU: Alert? Verbal? Painful stimuli? Unresponsive?)
B: Breathing (rate, depth, effort)
C: Circulation (color, IV)
D: Dressings (check dressings, surgical sites)
E: Equipment/environment (check pumps, tubes, chest tubes, etc., and assess environment for warmth, lights on, shades drawn, clutter, safety)

Assess F to I at the bedside:

F: Facts/feeling: how is the patient feeling? how was his/her day/night? does he/she have pain? what are his/her needs this shift?
G: Get vital signs: look, listen, and feel
H: Head to toe: Any emergency findings at any point in your assessment? Go to I.
I: Intervene

presents another alphabetic mnemonic to achieve a quick and systematic baseline for each patient. Subtle changes in a patient's condition may go unnoticed if a thorough, focused physical examination is not done early in the shift. The examination and reassessments should be *prioritized and systematic*. *Inspection* is a critical part of the physical examination and should be done in conjunction with *palpation* and *auscultation*. Percussion, however, is used much less often.

Table 3–2 presents a guide to conducting a focused physical examination with emphasis on the following systems: respiratory, cardiovascular, gastrointestinal/genitourinary (GI/GU), neurological, and musculoskeletal/skin. In addition to assessing the patient, the nurse should "assess" the room as an extension of the patient's physical systems.

Table 3–3 lists typical assessment techniques and normal and abnormal documentation findings for the major body systems.

Table 3–4 lists the 12 cranial nerves, a basic evaluation of each nerve, and a brief listing of normal and abnormal findings.

The skin is the largest organ of the body, and the nurse may need to document lesions that develop on a patient or monitor existing lesions. Lesions are any pathological change in normal tissue. Common examples include lacerations, incisions, rashes, moles, and ulcers. The nurse assessing a lesion should use the mnemonic "cuts-n-rashes" to evaluate the lesion's characteristics. Table 3–5 lists these characteristics with a brief explanation and sample documentation (based on Fig. 3–4). Lesions in patients with dark skin (African Americans) may present with characteristics different from those of light-skinned patients. Erythema, a typical sign of infection, may be difficult to assess in dark skin, and the nurse may need to evaluate other typical characteristics of infection (increased

Table 3–2 Alphabetical Mnemonic for Systematic Physical and Room Assessment

SYSTEM	PHYSICAL EXAMINATION SKILLS	ADDITIONAL ROOM ASSESSMENT
Airway	*Inspect:* Patent and unobstructed airway *Listen:* Is the patient talking? Is there stridor? Do you feel air movement from the patient's mouth or nose?	Verify suction ready for removing secretions or emesis

Table 3–2 Alphabetical Mnemonic for Systematic Physical and Room Assessment—cont'd

SYSTEM	PHYSICAL EXAMINATION SKILLS	ADDITIONAL ROOM ASSESSMENT
*B*reathing	*Inspect* and *palpate*: Work of breathing—evaluate rate and rhythm; skin temperature and moisture—rise and fall of chest; abnormalities *Auscultate:* Listen with diaphragm over posterior and anterior; upper, mid, and lower lobes; alternating side-to-side, through a complete inspiration and expiration cycle; document rate, rhythm, normal sounds, abnormal sounds (Fig. 3–1)	Oxygen equipment: correct amount oxygen and delivery device (cannula, mask, bag-valve mask)

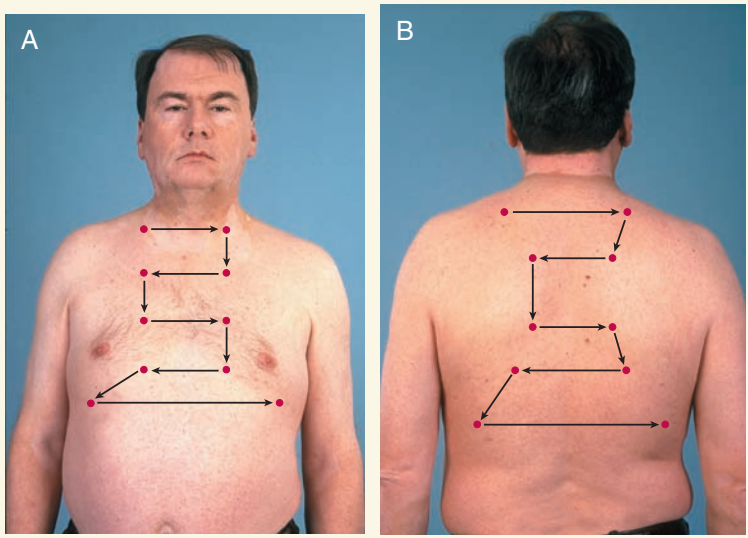


FIGURE 3-1: *A,* Anterior respiratory auscultation sites; *B,* Posterior respiratory auscultation sites.

Continued

Table 3–2 Alphabetical Mnemonic for Systematic Physical and Room Assessment—cont'd

SYSTEM	PHYSICAL EXAMINATION SKILLS	ADDITIONAL ROOM ASSESSMENT
Circulation	*Inspect* and *palpate:* Skin color, temperature, and moisture; pulses—amplitude, bilaterally equal *Auscultate:* Multiple sites over precordium; document rate, rhythm, normal sounds, abnormal sounds (Fig. 3–2)	IV site: Signs of infection or extravasation IV tubing: correct date IV fluids: correct type IV pump: correct rate

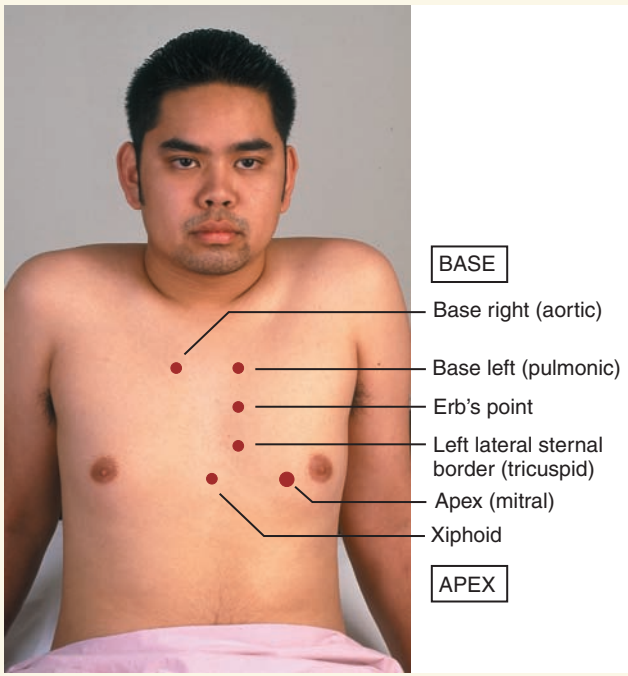


FIGURE 3-2: Cardiac auscultation sites.

Table 3–2 Alphabetical Mnemonic for Systematic Physical and Room Assessment—cont'd

SYSTEM	PHYSICAL EXAMINATION SKILLS	ADDITIONAL ROOM ASSESSMENT
*D*isability (Neurological)	*Inspect* and *assess:* Responsive (AVPU) or unresponsive; check pupil response	Television working, reading material available
*D*igestion (GI/GU)	*Auscultate:* Bowel sounds throughout abdomen *Palpate:* Check for tenderness (rebound), distention, or masses (Fig. 3–3)	Bedpan, urinal, commode, toilet paper available Urinary drainage system functions Urine amount and color

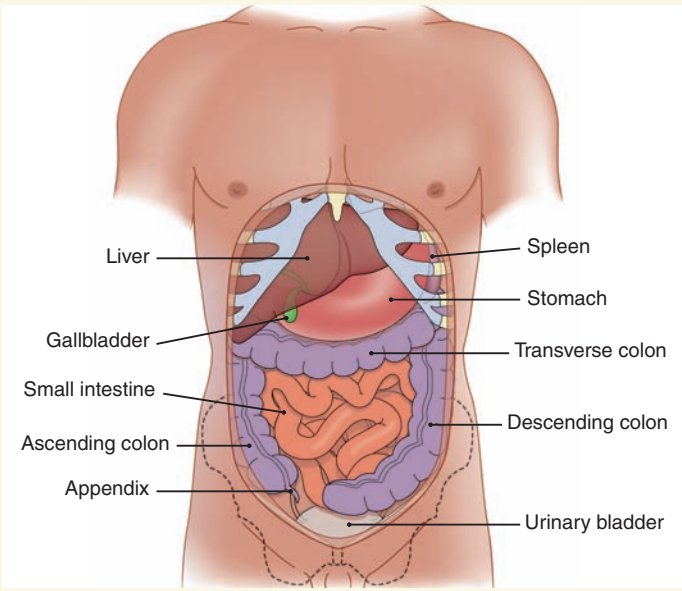


FIGURE 3-3: Abdominal organs.

Continued

Table 3–2 Alphabetical Mnemonic for Systematic Physical and Room Assessment—cont'd

SYSTEM	PHYSICAL EXAMINATION SKILLS	ADDITIONAL ROOM ASSESSMENT
External (Musculoskeletal and skin)	*Musculoskeletal—Inspect* and *palpate*: Joint range of motion (ROM), extremity circulation, movement, and sensation (CMS) *Skin—Inspect* and *palpate*: Skin—temperature, texture, turgor, and moisture; lesions, wounds, incisions—color, elevation, pattern or shape, size (cm), location and distribution, exudate (color, consistency, amount)	Trapeze Antiembolism devices Pressure point devices: special mattresses, heel/elbow cups Lotion

Table 3–3 Assessment Techniques and Documentation Findings

EXAMINATION	NORMAL FINDINGS	ABNORMAL FINDINGS
HEAD, EYES, EARS, NOSE, THROAT (HEENT)		
Inspect and Palpate Bony structures and soft tissues of the head	**Head** Normocephalic Atraumatic	Micro/macrocephalic Lesions (wounds, rash) Infestations (lice, fungus)
Inspect and Test Pupil size, shape, reactivity to light Conjunctiva Extraocular muscle function (EOM) Visual acuity	**Eyes** Pupils equal, round, reactive to light (PERRL) Clear EOM intact 20/20 in both eyes	Mydriasis, miosis, anisocoria Ptosis Injected, chemosis Strabismus, nystagmus
Inspect and Palpate Auricle/tragus: size, shape, tenderness Whisper test	**Ears** External ears atraumatic and nontender; canals clear, without exudates; hearing grossly intact; patient responds appropriately to questions	Tragal tenderness Bloody/cerebrospinal fluid (CSF) drainage Diminished hearing

Table 3–3 Assessment Techniques and Documentation Findings—cont'd

HEAD, EYES, EARS, NOSE, THROAT (HEENT)		
Inspect and Palpate Bony structures and soft tissues of the nose	**Nose** Midline atraumatic, without tenderness or exudate	Deviated septum Anosmia Polyps Discolored or excessive exudate
Inspect Lips, oral and buccal mucosa, gums, teeth, tongue, floor of mouth, pharynx *Test* Tongue strength/ protrusion	**Throat** Pink and moist without lesions Midline	Erythema, edema, exudates, caries, lesions Deviation to one side or decreased strength
NECK		
Inspect and Palpate Lymph nodes Thyroid Trachea Jugular veins *Palpate and Auscultate* Carotid arteries	Nontender, mobile, not enlarged Nontender, not enlarged Midline Nondistended Regular rhythm	Tender, fixed, lymphadenopathy Goiter, nodules Deviated Distended Bruits, bigeminal pulse, thrill
THORAX AND LUNGS		
Inspect and Palpate Chest wall/skin Respiratory effort *Auscultate* Posterior and anterior lung lobes	Anterior-posterior:transverse diameter (AP:T) = 1:2, skin warm, moist without cyanosis or lesions Eupnea Lung sounds clear to auscultation, equal, with adequate aeration, bilaterally	Barrel chest, deformity, or asymmetry; subcutaneous emphysema; cyanosis; nail clubbing Retractions, accessory muscle use, increased work of breathing, dyspnea, bradypnea, tachypnea Rales (crackles), rhonchi, wheezes, stridor, diminished breath sounds/aeration

Continued

Table 3–3 Assessment Techniques and Documentation Findings—cont'd		
CARDIOVASCULAR		
Inspect and Palpate Peripheral pulses Precordium, apical impulse *Auscultate* Precordium sites	Equal, 2+ amplitude, bilaterally Regular rate and rhythm, S1 and S2, without murmurs, rubs, gallops, or splits	Diminished, pulsus alterans, bigeminal pulse, paradoxical pulse Lifts, heaves, thrills Irregular rhythm, S3, S4, murmurs, pericardial friction rub, splits
GI/GU		
Inspect Abdominal wall/skin *Auscultate* Bowel sounds *Palpate* Abdominal organs *Percuss* Costovertebral angle	Flat, nondistended, without lesions All four quadrants normoactive Nontender, without organomegaly Nontender	Scaphoid, distended, obese Hyperactive, hypoactive, borborygmi Positive McBurney's point tenderness, inspiratory arrest, rigid, hepatomegaly, splenomegaly Positive costovertebral angle tenderness
NEUROLOGICAL		
Inspect and Assess Mental status (Mini-Mental State Exam, Glascow Coma Scale) Cranial nerves (see Table 3–4) Sensation (sharp and dull) Coordination Deep tendon reflexes (DTR) 5+ = Sustained clonus 4+ = Very brisk, hyperreflexive, with clonus 3+ = Brisker or more reflexive than normal	Mental status examination shows appropriate speech, behavior, and appearance; alert and oriented (A&O) × 3 (to person, place, and time) with intact recent and remote memory Cranial nerves II–XII grossly intact Sharp and dull correctly identified on all extremities Range of motion (ROM) without deficit, negative for Romberg's sign, negative for pronator drift Smooth, even gait	Slurred speech, disheveled clothing, poor hygiene; A&O × 1 to name only; memory test responses inaccurate See Table 3–4 Diminished sharp or dull perception in distal feet bilaterally Spastic gait with uncoordinated ROM; positive for Romberg's sign Hyperreflexic (4+) right patellar DTR

Table 3–3 Assessment Techniques and Documentation Findings—cont'd		
2+ = Normal amount of reflex 1+ = Low normal, diminished reflex 0.5+ = Reflex elicited only with reinforcement 0 = No response	DTR 2+ (normal amount of reflex) bilaterally	
MUSCULOSKELETAL		
Inspect, Palpate, and Test Upper and lower extremities/joints, back (strength and range of motion [ROM])	Full, active ROM; strength +5/5	Edema, decreased ROM/strength, crepitus
INTEGUMENTARY		
Inspect and Palpate Skin Color, temperature, turgor, moisture Check lesions/wounds for color, elevation, pattern or shape, size (cm), location and distribution, exudate (color, consistency, amount) (see Table 3–5)	Coloration normal for race, warm, dry; elastic turgor	Pale, cyanotic, tenting turgor

skin temperature, localized edema and tenderness, purulent exudate). Dark-colored skin often appears ashen-gray or dusky and loses its shiny texture when circulation to an area is decreased. Nurses working with populations having a range of skin coloration need to learn through experience and the mentoring of more experienced nurses the assessment of wounds and lesions in these patients.

Table 3–4 Cranial Nerves			
CRANIAL NERVE NUMBER, NAME[1] AND FUNCTION[2]	BASIC TESTING	NORMAL FINDINGS	ABNORMAL FINDINGS
I Olfactory (S)[2]	Occlude each naris; test smell with two familiar, distinct, nonirritating scents (coffee, soap) [rarely tested]	Intact bilaterally (B)[2]	Anosmia
II Optic (S)	Snellen eye chart or pocket vision screening	20/20 OU	Diminished vision
III Oculomotor (M)[2]	Motor (M): Extra ocular movement Sensory (S): Shine light in pupil	M: Equal OU movement to medial, upper inner, and outer, and lower outer areas S: Equal OU light reflex	M: Ptosis, strabismus, nystagmus S: Nonresponsive light reflex
IV Trochlear (M)	Extraocular motor (EOM) movement	Down and inward OU movement	Incorrect movement
V Trigeminal (B)	M: Palpate for masseter and temporalis muscle contraction with hands S: Test and compare light touch to forehead, cheek, and chin bilaterally	M: Strong contraction with teeth clenching S: Positive sensation in all three branches (B)	M: Diminished or absent contraction S: Loss of sensation in one or more branches
VI Abducens (M)	EOM movement	Lateral OU movement	Incorrect movement
VII Facial (B)	M: Ask patient to smile, frown, close eyes tightly, purse lips and puff cheeks, show teeth S: Test taste in anterior two-thirds of tongue [rarely tested]	M: Facial movements intact (B) S: Sweet, sour, salty taste intact (B)	M: Diminished or absent facial movements S: Diminished or absent taste

Table 3–4 Cranial Nerves—cont'd

CRANIAL NERVE NUMBER, NAME[1] AND FUNCTION[2]	BASIC TESTING	NORMAL FINDINGS	ABNORMAL FINDINGS
VIII Acoustic (S)	Evaluate ability to hear whisper or snapping fingers in each ear	Hearing grossly intact (B)	Diminished hearing
IX Glossopharyngeal (B) X Vagus (B)	M: Evaluate speech, swallowing, and uvula rising when patient says "ah" S: Test taste in posterior third of tongue [rarely tested]	M: Clear speech with uvula rising midline; positive gag reflex S: Sweet, sour, salty taste intact (B)	M: Voice changes, uvula rises to one side, dysphagia or absent gag reflex S: Diminished or absent taste
XI Spinal accessory (M)	Have patient shrug shoulders and move head side to side against resistance	Symmetrical, strong movements	Diminished strength or unequal movement
XII Hypoglossal (M)	Evaluate speech; protrude tongue and move side to side	Clear, articulate speech; tongue protrudes midline	Dysarthria; tongue protrudes to one side

1. Sample mnemonic for remembering cranial nerves: *O*n *O*ld *O*lympus Towering Tops A Finn And German Viewed Some Hops
2. Sample mnemonic for remembering whether each cranial nerve has sensory (S), motor (M), or both (B) functions: Some Say Marry Money But My Brother Says Bad Business Marry Money

Pain Assessment

Pain is referred to as the "fifth vital sign" and is an expected and routine part of patient assessment. The standard of the Joint Commission (JC) regarding pain assessment states: "A comprehensive pain assessment is conducted as appropriate to the individual's condition and the scope of care, treatment and services provided" (JC, 2008, Paragraph 2). The nurse is responsible for

Table 3–5 Cuts-n-Rashes: A Skin Assessment Mnemonic and Lesion Example	
MNEMONIC AND LESION CHARACTERISTIC	**SAMPLE DOCUMENTATION**
*C*olor: Describe lesions' shades of color and note changing color over time	Centralized blackened area with dark erythematous border and mild erythema out to 7 cm
*U*nusual symptoms: Ask the patient if experiencing any systemic symptoms; these may be due to the lesions (e.g., fever, malaise)	Patient complains of recent generalized malaise and achiness
*T*exture: Palpate the lesions' texture; how do the lesions feel?	Rough texture in central area
*S*hape: Describe the lesions' shape	Generally circular
*N*oxious: Are the lesions itchy? painful?	Patient complains of mild itchiness and moderate tenderness
*R*eason: Does the patient know what caused the lesions?	Patient states "bitten by a spider"
*A*rea: Describe location and distribution of the lesions	Right posterior calf
Size: Measured in cm or mm	Central area blackened area ~0.5 cm in diameter with erythematous border 1 cm; mild erythema extends 7 cm out from lesion
*H*eight: Are the lesions elevated above the skin? How deep are they?	Central area elevated ~0.25 cm
*E*xudate: Describe any drainage: Type, color, consistency, and quantity	Small amount of purulent exudates from central lesion
*S*mell: Do the lesions or drainage have an odor?	No noticeable odor

FIGURE 3-4: Example of a lower leg lesion.

determining an appropriate frequency of assessing pain based on each patient's unique condition.

Pain is a subjective finding, and the nurse should be aware that the patient is the authority on his or her pain and is the only one who can define the pain experience. The nurse must rely on the patient's *words* and *behaviors* to understand that individual's pain experience. The response to pain is influenced by past personal experiences and by social and cultural factors. For example, frequent painful procedures in infants may alter the child's pain response for the rest of his or her life. Long-term consequences for infants who had repetitive and poorly controlled pain include neurodevelopmental problems, poor weight gain, learning disabilities, psychiatric disorders, and alcoholism. Thus, management of pain is a very important part of the nurse's role as a patient advocate. The margin note presents the ABCs of Pain Management.

THE ABCs OF PAIN MANAGEMENT:

A—Ask about pain regularly; assess pain systematically.
B—Believe the patient and family in their reports of pain and what relieves it.
C—Choose pain control options appropriate for the patient, family, and setting.
D—Deliver interventions in a timely, logical, and coordinated fashion.
E—Empower patients and their families; enable patients to control their course to the greatest extent possible.

Patients may exhibit physical signs when they are in pain, but the facial expressions and other physical responses to pain may be unique to an individual and are not necessarily valid across all patient populations. Likewise, there are no specific changes in vital signs that can be attributed solely to pain. In some cases the patient's pulse may accelerate; in other cases it may decelerate. Grimacing, writhing, facial

tension, and guarding are some physical signs the nurse may objectively document that typically indicate the patient is in some discomfort.

Patients use many words to describe the pain they are experiencing; nurses should be familiar with a wide range of pain descriptors, which are presented in the margin note. No single pain assessment method or pain scale is best for all purposes. The nurse may need to use a variety of assessment techniques to evaluate fully a patient's pain status. The subjective history-gathering tool in Table 3–1 provides an organized framework to assess a patient's pain and other subjective complaints. Evaluating pain in the nonverbal pediatric or elderly patient can present unique challenges to the nurse. These populations often experience inadequate pain control by health-care providers.

WORDS USED FOR PAIN

Aching, throbbing, shooting, stabbing, gnawing, sharp, tingling, burning, exhausting, stretching, penetrating, nagging, numb, miserable, unbearable, dull, radiating, squeezing, crampy, deep, pressure

Pain scales assist the nurse in assessing and monitoring a patient's pain level. The numeric rating scale is probably the most commonly used measure for determining a patient's pain level. In this scale, the nurse asks the patient to rate his or her pain from 0 to 10, with 0 being no pain and 10 being the worst pain. With all pain scales, the responses of the patient are valid only for that patient and that situation. A response of 5/10 in one patient will not necessarily correspond to the same report of pain in another patient. Frequent re-evaluation using the same pain scale will help the nurse *and* patient develop a consistent monitoring of the patient's pain and the response to therapeutic modalities to alleviate the pain.

In nonverbal but conscious adults, the nurse may use a visual analog scale to assess and monitor pain. In this scale, a 10-cm line is drawn with "no pain" labeled at one end and "worst pain" at the other end. The patient notes or marks his or her pain level at a corresponding point on the line.

Many pain scales have been developed for use in the pediatric population. Some of these scales use drawings or pictures of faces in pain, such as the Oucher Scale and Wong-Baker FACES Pain Rating Scale (Fig. 3–5). The Oucher Scale can include culturally appropriate pictures for assessment in patients of different races. The Poker Chip Tool asks children older than 4 years to pick the number of poker chips from a pile that corresponds to their pain level. Older children can also use the numeric or visual analog scales. Pain assessment in the neonate is especially challenging; the scales developed for this patient population often ask the

Wong-Baker FACES Pain Rating Scale

0	1	2	3	4	5
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Face 0 is very happy because he doesn't hurt at all. Face 2 hurts a little more. Face 3 hurts even more. Face 4 hurts a whole lot. Face 5 hurts as much as you can imagine, although you do not have to be crying to feel this bad. Ask the person to chose the face that best describes how he is feeling. Rating scale is recommended for persons age 3 and older.

FIGURE 3-5: FACES pain rating scale.

nurse to evaluate a number of characteristics such as facial expression, sleep status, body movements, response to touch, and crying level. Nurses working with the unique populations of pediatrics, unconscious or nonverbal adults, or patients experiencing dementia should follow the pain assessment tools recommended by their facility.

Chapter Summary

This chapter presented ways to master assessment, the initial step of the nursing process and a hallmark of professional practice. Use of mnemonics and tabled information will accelerate your capabilities to provide focused and systematic assessments, which contribute to desired patient outcomes and patient safety. The next chapter focuses on diagnostics, an essential part of collaborative practice.

CHAPTER 4

Diagnostics: Understanding and Monitoring Common Laboratory Tests

Diagnostic studies cover a dizzying array of tests and procedures. It can be overwhelming trying to learn the important aspects of each test. Laboratory studies include analysis of blood, urine, and other patient samples such as sputum, exudates from wounds, nasal secretions, stool, and tissue samples. Other diagnostic tests evaluate radiological and ultrasonic views of the body, electrical rhythm of the heart (electrocardiogram), and electrical activity of the brain (electroencephalogram). This chapter focuses on the most commonly used laboratory diagnostic tests and basic electrocardiogram (ECG) rhythms.

The nurse is often responsible for the collection and submission of samples to a facility's laboratory, initial interpretation of results, and documentation of related aspects of the nursing process. Most nurses obtain occasional experience with diagnostics during clinical rotations, practicum, and new graduate orientation, but their overall understanding remains limited because these experiences relate to orders for individual patients. As a result, many nurses feel inadequately prepared for the range of diagnostics they will encounter in daily practice. They may know to consult their facility's laboratory manual or ask department personnel when unsure about proper sample collection technique or equipment (e.g., correct blood tubes). Many diagnostics, however, have an element of urgency, so mastery of common diagnostics will increase confidence for everyday practice. This confidence

rapidly becomes the foundation for the curiosity, commitment, and courage necessary to participate in more specialized tests and procedures.

Blood Tests

Common blood diagnostic tests include the complete blood count (CBC), basic and complete metabolic panels (BMP and CMP), cardiac markers, and coagulation panels. Before reviewing the correct procedure to obtain a blood sample, review the common errors in blood collection and sampling presented in the margin notes.

COMMON COLLECTION ERRORS

Inadequate sample amount
Inappropriate collection media or container
Incorrect storage/temperature after collection
Delay in delivering sample for analysis
Incorrect or inadequate documentation on sample

COMMON SAMPLING ERRORS

Blood hemolysis (needle too small, tourniquet on too long, needle bevel down, pulling forcefully back on syringe)
Blood drawn from above intravenous site
Cleaning solution (alcohol) not dry before venipuncture
Wrong order of drawing tubes
Failure to mix (invert) blood in tube after drawing

Blood sampling occurs most commonly through venipuncture. The nurse follows these general steps for venipuncture blood sampling:

1. Check laboratory test order (patient, time, and date)
2. Acquire appropriate supplies: correct blood tubes, syringe or vacuumized needle and holder system (e.g., BD Vacutainer [Fig. 4–1]), tourniquet, skin cleaning and disinfecting solution, gauze, and tape or bandage.
3. Place patient in a comfortable position, and assess for latex allergies and previous venipuncture problems.
4. Wear gloves. Apply tourniquet to patient above intended venipuncture site; find and palpate an appropriate vein.
5. Clean and dry venipuncture site according to facility protocol. To prevent hemolysis and alteration of some test results, do not leave the tourniquet on for more than 1 minute before obtaining the sample.
6. Puncture skin, and obtain adequate blood amount in correct tube order (see below). Gently invert tubes, and mix blood with additives.
7. Remove tourniquet, remove needle, and apply pressure with small gauze over puncture site. Do not have patient bend his or her elbow, which actually increases bleeding at the puncture site. Apply tape or bandage over gauze.

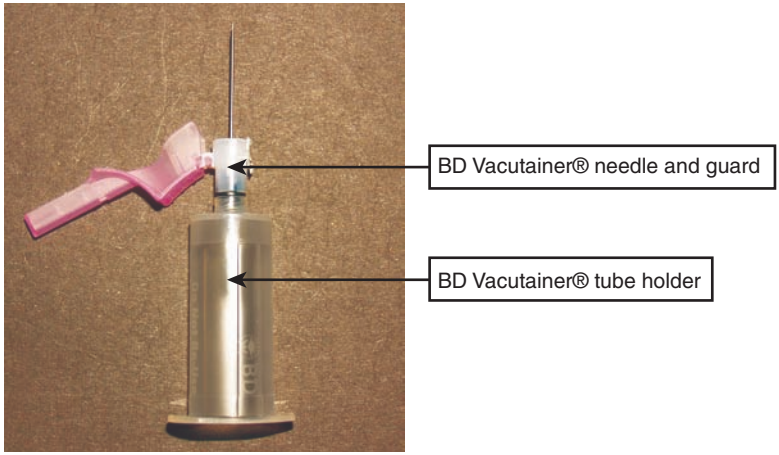


FIGURE 4-1: BD Vacutainer system with tube holder and needle for drawing blood.

8. Document patient data, time, and date and initials of phlebotomist on each blood tube. Package blood tubes in biohazard bag, and send samples to laboratory for analysis as per facility protocol.
9. Monitor patient for problems from venipuncture.

When collecting multiple blood tubes, draw the blood following a specific order. In general, collect blood in tubes without additives (e.g., red top) before using tubes with additives (e.g., blue top). If unsure of the sequence of blood collection, consult your facility's laboratory manual. The Clinical and Laboratory Standards Institute recommends the following order for blood collection:

1. Blood culture tubes
2. Waste or discard blood tubes (if necessary, use non-additive red top)
3. Coagulation tubes (blue top) (see Fig. 4–1)
4. Non-additive tubes (red top, mottled/tiger-top serum separator tube [SST]) (Fig. 4–2)
5. Heparin tubes (green top)
6. EDTA (lavender, pink, or white top) (see Fig. 4–2)
7. Oxalate-fluoride tubes (gray top)

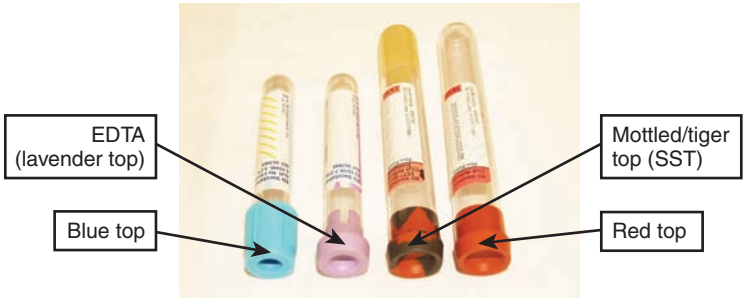


FIGURE 4-2: Common blood tubes (left to right): Coagulation tube (blue top), ethylenediamine tetraacetic acid (EDTA) (lavender top), non-additive tubes (mottled/tiger-top SST and red top).

Tables 4–1 through 4–4 summarize what must be known about blood collection and sampling. The tables list:

- Each test and its major components
- The test tube or other sample collection device
- The normal value for each component
- Abnormal values, with possible causes for high and low values
- Critical or panic values, if applicable
- Nursing considerations

The laboratory values in the tables may be different from an individual facility's values due to a variety of diagnostic machines and standards. The values listed here for each test refer to *adults only* and appear in conventional units; many laboratories also use standard international (SI) units. The values used for these tables come from Davis's *Laboratory and Diagnostic Tests with Nursing Implications* (Van Leeuwen, Kranpitz, & Smith, 2006). Refer to this manual or consult your hospital's laboratory manual as needed and especially in the following situations:

- For abnormal values: many drugs can alter the values of specific laboratory tests.
- For pediatric patients, values vary significantly from infancy through childhood.

Table 4–1 lists the components of the CBC. The CBC is probably the most frequently performed blood test and has a variety of general and specific purposes.

Table 4–2 presents the components of a basic metabolic panel (BMP) and complete metabolic panel (CMP). These tests look at the electrolyte and chemical composition of the blood. In the past, chemistry panels had

Table 4–1 CBC*†

COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		High	Low	
		Frequently Reviewed Components		
HCT (hematocrit)	38%–44% (F) 43%–49% (M)	Dehydration, high altitude, polycythemia vera, chronic hypoxia	Anemia, alcohol abuse, hemorrhage, hemolysis, pregnancy, dilution	<18% >54%
Hgb (hemoglobin)	11.7–16.1 g/dL (F) 12.6–17.4 g/dl (M)	Dehydration, high altitude, polycythemia vera, chronic hypoxia	Anemia, alcohol abuse, hemorrhage, hemolysis, pregnancy, dilution	<6 g/dL >18 g/dL
Plt (platelet count)	150–450 × 10^3/mm^3	Acute infection, anemias, heart disease, cirrhosis, liver disease, leukemias, malignancies, polycythemia vera, surgery, trauma, tuberculosis (TB)	Hemolytic anemia, disseminated intravascular coagulopathy, severe hemorrhage, leukemia, prosthetic heart valve	<50 × 10^3/mm^3 >1000 × 10^3/mm^3
RBC (red blood cell) count	4.2–4.87 × 10^3 cells/mm^3 (F) 4.71–5.14 × 10^3 cells/mm^3 (M)	Stress, chronic hypoxia, dehydration, high altitude, polycythemia vera, hemoconcentration	Alcohol abuse, hemolytic anemia, hemorrhage, leukemia, pregnancy, overhydration	N/A

Continued

Table 4–1 CBC*†—cont'd				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		High	Low	
WBC (white blood cell) count	4.5–11 × 10^3 cells/mm^3	Infections, anemias, inflammatory disorders, pregnancy, leukemias	Anemia, alcoholism, bone marrow depression, radiation, autoimmune disorders, viral infections, antineoplastic drugs	<2.5 × 10^3 cells/mm^3 >30 × 10^3 cells/mm^3
Less Frequently Reviewed Components				
MCH (mean corpuscular hemoglobin)	28–32 pg/cell	Macrocytic anemias	Hypochromic or microcytic anemias	N/A
MCHC (mean corpuscular hemoglobin concentration)	33–35 g/dL	Macrocytic anemias	Thalassemias, spherocytosis	N/A
MCV (mean corpuscular volume)	85–95 fL	Alcoholism, liver disease, pernicious and vitamin B_{12}/folate anemias	Iron-deficiency anemia, thalassemias	N/A
MPV (mean platelet volume)	7.0–10.2 fL	Increased platelet turnover, leukemias, thrombocytopenic purpura, prosthetic heart valve, splenectomy, massive hemorrhage	Aplastic anemia, Wiskott-Aldrich syndrome	

Table 4–1 CBC*†—cont'd				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
RDW (RBC distribution width)	11.6–14.8	Anemias	N/A	N/A

*Purpose: Basic screening of patient's blood cellular elements, RBC indices, and cell morphology.
†Nursing considerations: Fill a 5-mL lavender-top tube (EDTA) with a random blood draw. Tourniquet on <60 seconds. Avoid veins near infusing fluids. Process within 6 hours at room temperature or 24 hours refrigerated.

other names (such as Chem 7, Chem 22, SMA-6, and SMA-12), but recent federal guidelines standardized the nomenclature for chemistry panels.

Table 4–3 looks at blood tests related to the cardiac markers of creatine kinase myocardial band (CK-MB) fraction and cardiac troponin I and T (cTnI, cTnT). The creatine kinase test is less frequently used, and most

Table 4–2 BMP and CMP*†				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		High	**Low**	
		BMP and CMP Tests		
Anion gap (Agap)	8–16 mEq/L	Dehydration, acidosis, poisoning, renal failure, uremia	Hypochloremia, gammaglobulinemia, albuminemia, hyponatremia	N/A
Blood urea nitrogen (BUN)	8–21 mg/dL	Nephropathy, azotemia, congestive heart failure (CHF), diabetes, hyperalimentation, hypovolemia, muscle wasting, ketoacidosis	Celiac disease, malnutrition, pregnancy, liver failure	>100 mg/dL

Continued

Table 4–2 BMP and CMP*†—cont'd				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		High	Low	
Calcium (Ca^+)	8.2–10.2 mg/dL	Acidosis, Addison's disease, cancer, dehydration, hyperparathyroidism, Paget's disease, pheochromocytoma, rhabdomyolysis, thyrotoxicosis	Alcoholism, alkalosis, chronic renal failure, pancreatitis, cirrhosis, malnutrition	<7 mg/dL >12 mg/dL
Carbon dioxide (CO_2)	22–26 mmol/L	Respiratory acidosis, metabolic alkalosis, hypoventilation, electrolyte disturbance, TB	Acute renal failure, hyperventilation, diabetic ketoacidosis, severe diarrhea, metabolic acidosis, respiratory alkalosis, salicylate poisoning	<15 mmol/L >40 mmol/L
Chloride (Cl^-)	97–107 mEq/L	Acute renal failure, Cushing's syndrome, dehydration, diabetes insipidus, prolonged diarrhea, respiratory alkalosis, salicylate poisoning	Addison's disease, burns, CHF, gastrointestinal (GI) loss, diabetic ketoacidosis, overhydration, respiratory acidosis	<80 mEq/L >115 mEq/L

Table 4–2 BMP and CMP*†—cont'd				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
Creatinine	0.5–1.1 mg/dL (F) 0.6–1.2 mg/dL (M)	CHF, dehydration, rhabdomyolysis, shock, hyperthyroidism, renal failure	Inadequate protein intake, pregnancy, liver disease	>7.4 mg/dL
Glucose (blood sugar)	65–99 mg/dL (fasting)	Acute stress, trauma, diabetes, hemochromatosis, myocardial infarction (MI), pancreatitis, strenuous exercise, thyrotoxicosis	Alcohol ingestion, Addison's disease, hypothyroidism, glycogen storage diseases, starvation, excess insulin	<40 mg/dL >400 mg/dL
Potassium (K^+)	3.5–5 mEq/L	Acidosis, diabetes, renal failure, increased intake, dehydration, hemolysis, ketoacidosis, tissue trauma, pregnancy	Alcoholism, inadequate intake, Cushing's syndrome, excess insulin, gastrointestinal loss, pica	<2.5 mEq/L >6.5 mEq/L
Sodium (Na^+)	135–145 mEq/L	Azotemia, dehydration, Cushing's syndrome, excessive intake, vomiting	Addison's disease, CHF, cirrhosis, cystic fibrosis, excessive diuretics, inadequate intake, renal failure, syndrome of inappropriate diuretic hormone (SIADH), water intoxication	<120 mEq/L >160 mEq/L

Continued

Table 4–2 BMP and CMP*†—cont'd				
COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		CMP Tests Only		
Albumin (Alb)	3.4–4.8 g/dL	Dehydration, blood loss	Malabsorption, malnutrition, liver disease, infection, burns, pregnancy, nephropathy	N/A
Alkaline phosphatase (ALP)	25–125 U/L (F) 35–142 U/L (M)	Liver disease, bone disease, pregnancy, atherosclerosis	Anemia, celiac disease, nutritional deficiencies	N/A
Alanine aminotransferase (ALT), serum glutamic pyruvic transaminase (SGPT)	7–35 U/L (F) 10–40 U/L (M)	Acute pancreatitis, alcohol abuse, cirrhosis, traumatic muscle injury, hepatitis, mononucleosis, shock	Pyridoxal phosphate deficiency	N/A
Aspartate aminotransferase (AST), serum glutamic oxaloacetic transaminase (SGOT)	9–36 U/L (F) 19–48 U/L (M)	Hepatitis, pancreatitis, shock, biliary obstruction, hemolytic anemia, CHF, muscle damage	N/A	N/A
Bilirubin, total (Tbil)	0.3–1.2 mg/dL	Hepatic jaundice, cirrhosis, hepatitis, mononucleosis, pernicious anemia, anorexia/ starvation	N/A	>15 mg/ dL

Table 4–2 BMP and CMP*†—cont'd

COMPONENT	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
Phosphorus (phosphate [PO_4])	2.5–4.5 mg/dL	Acromegaly, bone diseases, renal failure, diabetic ketoacidosis, respiratory acidosis, hypocalcemia	Hypercalcemia, hyperparathyroidism, hypokalemia, gout, severe vomiting/diarrhea, respiratory alkalosis	<1 mg/dL N/A
Protein, total (TP)	6–8 g/dL	Dehydration, myeloma, sarcoidosis	Burns, blood loss, malnutrition, malabsorption, nephritic syndrome, pregnancy, prolonged immobilization	

*Purpose: Evaluation of various chemical blood constituents, especially electrolytes, blood urea nitrogen (BUN), and glucose.

†Nursing considerations: Fill (~5 mL) and invert a red or marbled (tiger)-top tube with a random, timed, or fasting blood draw. Avoid veins near infusing fluids. Process promptly. Try to keep tourniquet on <60 seconds; a tourniquet on for a long time can cause venous stasis and hemolysis, which can affect some chemistry tests.

Table 4–3 Cardiac Markers

TEST	NORMAL VALUES	ABNORMAL RESULTS: POSSIBLE CAUSES OF HIGH VALUES ONLY
Creatine kinase myocardial band (CK-MB)	<4%–6% (electrophoresis) <10 ng/mL (immunoassay)	MI, cerebrovascular accident (CVA), pericarditis, rhabdomyolysis, cardiomyopathy, cardioversion *Critical value: N/A*

Continued

Table 4–3 Cardiac Markers—cont'd		
TEST	NORMAL VALUES	ABNORMAL RESULTS: POSSIBLE CAUSES OF HIGH VALUES ONLY
Troponin I (cTnI)	<0.35 ng/mL	Small infarcts, myocardial damage post cardiac surgery *Critical value: >1.5 ng/mL*
Troponin T (cTnT)	<0.20 ng/mL	Acute MI, myocardial damage post cardiac surgery or angioplasty; unstable angina; myocarditis; trauma; rhabdomyolysis *Critical value: N/A*

clinicians measure troponin I or T. These tests are generally used to evaluate possible heart muscle damage in conditions such as suspected acute MI and myocardial ischemia.

Table 4–4 lists the components of coagulation panels and includes the individual tests of prothrombin time (PT), from which the international normalized ratio (INR), activated partial thromboplastin time (APTT), and

Table 4–4 Coagulation Panels*†				
TEST	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
		High	**Low**	
PT **INR**	10–13 sec <2.0	Disseminated intravascular coagulation (DIC), hereditary factor (II, V, VII, X) disorders, cirrhosis, decreased fat absorption, causes of vitamin K deficiency, excess anticoagulant	Ovarian hyperfunction, enteritis, or ileitis	>3.0

Table 4–4 Coagulation Panels*†—cont'd				
TEST	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES		CRITICAL VALUES
APTT	25–39 sec	DIC, hemophilia factor deficiencies, polycythemia, severe liver disease, vitamin K deficiency, von Willebrand's disease, excess heparin	N/A	>70 sec
D-Dimer	No detectable fragments (qualitative) <250 ng/mL (quantitative)	Arterial or venous thrombosis, deep vein thrombosis (DVT), DIC, MI, pulmonary embolism (PE), pre-eclampsia, renal or liver failure	N/A	N/A

*Purpose: All tests are used in some way to evaluate coagulation. PT/INR is used specifically to monitor warfarin therapy. The INR is derived from the PT value and is used to normalize ratios across different laboratories. APTT is used specifically to monitor heparin therapy. D-dimer is used specifically to help detect DIC, DVT, MI, and PE.

†Nursing considerations: Completely fill (~5 mL) and invert blue-top (sodium citrate) tube with a random or timed blood draw. Partially filled tubes cannot be analyzed. Do not draw coagulation blood tests from a heparinized catheter. Keep tourniquet on <60 seconds; a tourniquet on for a long time can cause venous stasis and hemolysis, which can affect tests.

D-dimer are derived. Because PT and INR evaluate the ability of blood to clot properly, they can be used to assess bleeding and clotting tendencies. One common use of these is to monitor the effectiveness of anticoagulant drugs, such as warfarin (Coumadin).

Urinalysis

For patient urine samples, urinalysis (UA) is a frequently used diagnostic test. Culturing a patient's urine is also a common diagnostic test. Table 4–5 shows the components of the frequently run urinalysis. Urinalysis most

Table 4–5 UA*†			
TEST	NORMAL VALUES	ABNORMAL VALUES: POSSIBLE CAUSES	
		High	Low
Color	Pale yellow (straw-colored) to amber	Dark yellow may indicate dehydration; drugs, food, or metabolic byproducts may alter urine color	Colorless urine may indicate overhydration.
Appearance	Clear to slightly hazy	Cloudy urine may be due to pus, RBCs, bacteria, semen, vaginal discharges, or ingestion of certain foods or supplements	N/A
Specific gravity	1.005–1.030	CHF, dehydration, diabetes, nephritic syndrome, SIADH	Chronic renal failure, diabetes insipidus, glomerulonephritis
pH	5–9	Citrus fruits, alkalosis, vegetarian diet	High-protein ingestion, fruits (cranberries), acidosis
Protein	<20 mg/dL	Diabetic nephropathy, glomerulonephritis, toxemia of pregnancy, stress, exercise	N/A
Glucose	Negative	Diabetes, Cushing's syndrome, acromegaly	N/A
Ketones	Negative	Acute illness, diabetes, diabetic ketoacidosis (DKA), fasting, high-protein diet, postanesthesia vomiting, strenuous exercise	N/A
Hemoglobin	Negative	Renal calculi/trauma, malignancy, urinary tract infection (UTI), glomerulonephritis, systemic hemolysis, polycystic kidney disease, menstruation	N/A

Table 4–5 UA*†—cont'd			
TEST	**NORMAL VALUES**	**ABNORMAL VALUES: POSSIBLE CAUSES**	
Bilirubin	Negative	Cirrhosis, hepatitis, hepatic tumor, obstructive biliary disease	N/A
Urobilinogen	<1 mg/dL	Cirrhosis, hepatitis, CHF, hemolytic anemia, mononucleosis, pernicious anemia, malaria	N/A
Nitrite	Negative	Nitrite-forming bacteria, UTI	N/A
Leukocyte esterase	Negative	Bacterial/fungal/parasitic infection, glomerulonephritis, nephritis	N/A

*Purpose: Evaluate various constituents of patient's urine for screening and diagnostic purposes. Urine may also be cultured to screen for bacterial infection.

†Nursing considerations: Generally a random, clean sample of ~30 mL is obtained from either a "clean-catch" (see text) or from the drainage bag of an indwelling catheter. A clean urine collection cup is typically used to send the sample to the laboratory, but a sterile red-top tube can also be used. In a few urine tests, a "dirty" urine sample is collected. Nurses sometimes do a unit-based "dipstick" urinalysis, which uses biochemical markers on a small stick dipped into the urine to provide information for diagnostic purposes. Urine is usually tested at room temperature. Urine should be refrigerated if a delay in transport to the laboratory is expected.

commonly requires a clean-catch technique. The nurse explains the following steps to a male or female patient:

Male:

1. Have patient wash hands thoroughly.
2. Have patient cleanse the penile meatus from the center outward by using a washcloth with soap and water or urine sample collection kit cleansing towelettes (Peri-Wipes).
3. Have patient void a small amount of urine into the toilet. (A few urine tests require a urine sample that is not clean-catch. The patient should collect urine from the initial voiding.)
4. Have patient void "mid-stream" urine into collection cup.
5. Patient should replace lid on collection cup and give the urine sample to the nurse to record date, time, and initials and send to laboratory for analysis.

Female:

1. Have patient wash hands thoroughly.
2. Have patient spread and cleanse the labia from front to back by using a washcloth with soap and water or urine sample collection kit towelettes (Peri-Wipes.)
3. While keeping labia open, have patient void a small amount of urine into the toilet. Without stopping the urine stream, have patient void into collection cup.

ALERT

Many respiratory illnesses do not give a high $PaCO_2$ result on ABG unless the patient is close to death. With respiratory diseases, a drop in the $PaCO_2$ is the first sign of impending respiratory failure. A drop in the $PaCO_2$ with no change in PaO_2 means the patient is very sick and the nurse must notify the physician with that critical message.

COACH CONSULT

Without fail, of more than 40 students in a section of senior practicum, only 2 can interpret ABGs, typically because they already work in an emergency department. We offer a two-step method as taught by nurse educator Laura Gasparis Vonfrolio, PhD, RN, CEN, CCRN. At the end of a 40-minute session, all our students can interpret ABGs.

Arterial Blood Gases

Arterial blood gases (ABGs) refer to any of the gases present in blood. Clinically, they include the determination of levels of pH, oxygen, and carbon dioxide in the blood. ABGs are important in the diagnosis and treatment of disturbances of:

- Acid-base balance
- Pulmonary disease
- Electrolyte balance
- Oxygen delivery

Patients with respiratory, cardiac, renal, and metabolic disorders have ABG samples taken, often in emergent situations. Understanding ABG results is an essential part of patient care, making patient assessment more informed and patient management more specific. ABG interpretation confounds many nurses, yet mastery of this particular skill makes a nurse better prepared not only as a patient advocate but also as a valued resource for team members and even other units, especially at 3 a.m.!

Common approaches to ABG interpretation include a six-step analysis, a three-step analysis, and arrow-up/arrow-down using the ROME mnemonic (Respiratory Opposite, Metabolic Equal). In our experience, students cannot learn or retain ABG interpretation through these approaches. Instead, we endorse Vonfrolio's systematic number-line method, which consists of two steps. Below, we

walk you through the two steps, guide you through practice examples, and give you ABGs to interpret on your own with the answers immediately following.

Two-Step Approach to ABG Interpretation

Step 1: Look at the pH

- To obtain the first and last name of the imbalance, place the pH value on the number line.

Step 2: Look at $Paco_2$ and HCO_3^-

- To obtain the middle name of the imbalance, determine whether $Paco_2$ or HCO_3^- has the same last name according to placement on the number line.

First Name Choices:	**Middle Name Choices (can be both):**	**Last Name Choices:**
Uncompensated	Respiratory	Acidosis
Compensated	Metabolic	Alkalosis

Number-Line Evaluation of ABG Values

Normal Ranges

pH

Uncompensated Acidosis < 7.35–7.45 > Uncompensated Alkalosis

$Paco_2$

(Respiratory Acid)

Respiratory Alkalosis < 35–45 > Respiratory Acidosis

HCO_3^-

(Metabolic Base)

Metabolic Acidosis < 22–26 > Metabolic Alkalosis

Compensated Gases

Compensated Acidosis 7.35 < 7.40 > 7.45 Compensated Alkalosis

Step 1: Practice

1. If pH is 7.12, the first name is uncompensated; the last name is acidosis.
2. If pH is 7.55, the first name is uncompensated; the last name is alkalosis.
3. If pH is 7.02, the first name is uncompensated; the last name is acidosis.
4. If pH is 7.60, the first name is uncompensated; the last name is alkalosis

You try a couple, which are typical values in NCLEX-RN scenarios:

5. If pH is 7.48, the first name is _____; the last name is_____.
6. If pH is 7.30, the first name is_____; the last name is_____.

In Question 5, the first name is uncompensated, the last name is alkalosis. In Question 6, the first name is uncompensated, the last name is acidosis.

So that's easy! Now, add the second step.

Steps 1–2: Practice

ABG results: pH 7.21, $Paco_2$ 32, HCO_3^- 14

1. If pH is 7.21, the first name is uncompensated; the last name is acidosis.
2. What has the same last name?

Does a $Paco_2$ of 32 indicate acidosis? NO
Does an HCO_3^- of 14 indicate metabolic acidosis? YES
Result: uncompensated metabolic acidosis.

ABG results: pH 7.18, $Paco_2$ 68, HCO_3^- 29

1. If pH is 7.18, the first name is uncompensated; the last name is acidosis.
2. What has the same last name?

Does a $Paco_2$ of 68 indicate acidosis? YES
Does an HCO_3^- of 29 indicate metabolic acidosis? NO
Result: uncompensated respiratory acidosis

ABG results: pH 7.50, $Paco_2$ 26, HCO_3^- 21

1. If pH is 7.50, the first name is uncompensated, the last name is alkalosis
2. What has the same last name?

Does a $Paco_2$ of 26 indicate alkalosis? YES
Does an HCO_3^- of 21 indicate alkalosis? NO
Result: uncompensated respiratory alkalosis

ABG results: pH 7.52, $Paco_2$ 36, HCO_3^- 34

1. If pH is 7.52, the first name is uncompensated; the last name is alkalosis.
2. What has the same last name?

Does a $Paco_2$ of 36 indicate alkalosis? NO
Does an HCO_3^- of 34 indicate alkalosis? YES
Result: uncompensated metabolic alkalosis

ABG results: pH 7.36, $Paco_2$ 54, HCO_3^- 32

1. If pH is 7.36, the first name is compensated; the last name is acidosis.
2. What has the same last name?

Does a $PaCO_2$ of 54 indicate acidosis? YES
Does an HCO_3^- of 32 indicate acidosis? NO
Result: compensated respiratory acidosis

Common ABG Profiles

Accelerate your mastery of ABG interpretation by having possible scenarios or a mental picture of a patient for each common acid-base disturbance. If you see a patient with a chronic obstructive pulmonary disease (COPD) exacerbation, for example, predict the ABG result. You will tune up your thinking skills simultaneously. Following are profiles of the four most common acid-base disturbances.

Uncompensated Respiratory Acidosis
Sample ABG: pH 7.18, $Paco_2$ 68, HCO_3^- 29
Possible causes:

- Hypoventilation (COPD exacerbation)
- Wrong medications (for example, Gentamicin given to a patient with myasthenia gravis, which precipitates a myasthenic crisis: the patient gets ptosis and dysphagia and drools; then a decreased respiratory rate leads to a decreased tidal volume and then a respiratory arrest)
- Too much of some medications (opioid narcotics like morphine sulfate)

Notes:

- Bicarb (HCO_3^-, sodium bicarbonate) is *not* recommended for respiratory acidosis unless the patient is intubated and needs medications that will not work in an acidotic environment, such as some medications for patients with asthma. Do you know why? Sodium bicarbonate increases CO_2 production: $HCO_3^- + H^+$ (other acids) $\rightarrow H_2CO_3$ (carbonic acid) $\rightarrow H_2O + CO_2$ ($\uparrow$ respiratory acid, an excess of which caused the disturbance.)

Uncompensated Metabolic Acidosis
Sample ABG: pH 7.21, $Paco_2$ 32, HCO_3^- 14
Possible causes:

- Renal failure, because patients do not excrete all their sulfuric and phosphoric acids
- Diabetic ketoacidosis
- Low blood pressure, which leads to vasoconstriction, which deprives muscles of blood supply, which causes a buildup in lactic acid

Notes:

When the pH falls below 7.25, the blood vessels vasodilate, and the patient becomes mottled from pooling of blood in the capillaries. The low blood pressure gets lower from tachycardia, and the patient goes into shock.

Treatment is isotonic fluids (or hypertonic fluids if the patient is postoperative) and possibly sodium bicarbonate if the physician believes the acidosis will not correct quickly.

Uncompensated Respiratory Alkalosis

Sample ABG: pH 7.50, $Paco_2$ 26, HCO_3^- 21

Possible causes:

- Anxiety or panic attack
- Pain (MI)
- Cirrhosis (elevated ammonia [NH_3] levels, which make the medulla increase the respiratory rate to 28–32 breaths per minute)

Notes:

Correct alkalosis because:

- Alkalosis causes calcium to go into cells: low serum Ca^{++} causes numbness and tingling (watch for Chvostek's and Trousseau's signs).
- Alkalosis causes a shift in the oxyhemoglobin dissociation curve: a pulse oximeter may show adequate oxygen saturation, but less oxygen is let off to the tissues. For example, a patient with an MI has anxiety and pain, which increase the respiratory rate. Less oxygen is let off to ischemic tissues, which could extend an infarct. Therefore, in addition to aspirin and nitroglycerin, give morphine sulfate and oxygen.

Uncompensated Metabolic Alkalosis

Sample ABG: pH 7.52, $Paco_2$ 36, HCO_3^- 34

Possible causes:

- Nasogastric tube to suction
- Too much Ringer's lactate (lactate is converted to sodium bicarbonate by a functioning liver)

Notes:

- Treatment requires hospital therapy and monitoring: sodium chloride (NaCl) is given, because in alkalosis, H^+ comes out of the cell into the serum. The kidneys, however, in response to the increased acidosis, increase production of sodium bicarbonate, which worsens the condition. The remedy is to flood the kidneys with sodium chloride, which will dissociate. The kidneys will not

hold onto an excess of negatively charged sodium bicarbonate when bombarded with another negative ion (Cl^-).

Interpreting ECGs

Although ECG interpretation receives more attention in telemetry units and critical care areas, for patient safety every nurse must know how to read and interpret basic rhythms. Table 4–6 presents a comprehensive overview of ECGs.

We recommend evaluation of six aspects of a rhythm strip:

1. Rate
2. Rhythm
3. Complete/abnormal complexes
4. Axis
5. Hypertrophy
6. Infarction

Let's look at each of the six aspects in more detail:

1. Rate
   - Check patient's pulse (apical, radial for perfusion in abnormal rhythms such as atrial fibrillation)
   - Start at large box bold line that coincides with an R wave
   - Count down: 300, 150, 100, 75, 60, 50 at each large box bold line until you come to the next R wave
   - If the R wave is between two large box lines, use the table to determine the exact rate
   - For bradycardia rate = number of complexes/6-second strip × 10
2. Rhythm
   - Using calipers, measure distance between two consecutive R waves; measure distance between the next R waves; the distance is equal in a regular rhythm and unequal in an irregular rhythm

OXYGEN COLLECTION

Remember the oxygen (PaO_2)! ABGs also provide critical information about a patient's oxygen delivery. If the PaO_2 level is low, immediately check for a mechanical problem. Is the oxygen connected with correct liter flow? Next, consider what the patient's PaO_2 level is supposed to be. Take the percentage of oxygen your patient is receiving and multiply by 6 (the formula constant). Subtract the $PaCO_2$. Subtract the PaO_2. Example: A patient is on 30% O_2 by face mask. His ABG results show a pH of 7.35 (normal), PaO_2 of 70, and $PaCO_2$ of 45 (normal). Calculate: 30 × 6 = 180 – 45 = 135. The PaO_2 is supposed to be 135, but it is only 70. The difference (135 – 70 = 65) is called an oxygen delivery gradient. A patient is not supposed to have a gradient (the difference is supposed to be close to 0), so there is a problem with his oxygen delivery (due to atelectasis, pneumonia, pulmonary edema, ARDS, or another pulmonary disease process).

Table 4–6 Fast Facts for a Comprehensive ECG Assessment		
CARDIAC CELLS	**PROPERTIES**	
Electrical cells	Automaticity: cell's ability to generate and discharge an electrical impulse spontaneously Excitability: cell's ability to transmit an electrical impulse Conductivity: cell's ability to transmit an electrical impulse from one cell to another	
Myocardial cells	Contractility: ability of cell filaments to shorten and return to their original shape Extensibility: ability of cell filaments to stretch	
ELECTRICAL CONDUCTION SYSTEM	**PACEMAKER CELLS**	**SEEN AS:**
Sinoatrial (SA) node	Fire at 60–100 times/min	P wave: Atrial depolarization (impulse through SA node)
Internodal tracts Interatrial tracts (Bachmann's bundle)		P-R interval: time required to leave SA and travel to AV node, bundle of His, bundle branches, and to Purkinje's fibers
Atrioventricular (AV) node	Fire at 40–60 times/min	
Bundle of His		
Right and left bundle branches		
Purkinje's fibers, ventricular node	Fire at 20–30 times/min	QRS ventricular depolarization (impulse through ventricles)

Table 4–6 Fast Facts for a Comprehensive ECG Assessment —cont'd

CARDIAC CYCLE	PROPERTIES	NORMAL (Fig. 4–3)
P wave	Atrial depolarization (impulse through SA node)	Small, rounded, positive (upright) in lead II with amplitude 0.5–2.5 mm, duration 0.10 sec or less
PR interval	Time required to leave SA node and travel through AV node to bundle of His and bundle branches to Purkinje's fibers	From beginning P to beginning of QRS: 0.12–0.20 seconds
QRS complex	Ventricular depolarization (impulse through ventricles)	Beginning of QRS to ST segment: amplitude 2–15 mm and 0.04–0.10 seconds
ST segment	The end of ventricular depolarization and the beginning of repolarization	End of QRS to onset of T wave, normally flat (isoelectric) or follows the isometric line Abnormal: Elevation/depression by 1 mm or more above/below baseline or 0.08 sec or 2 small squares past J point

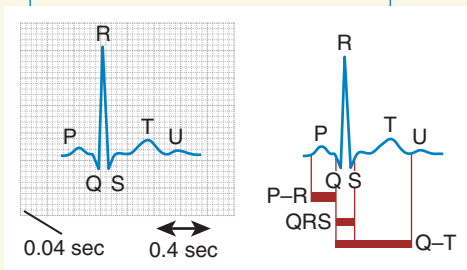


FIGURE 4-3: Normal ECG tracing with identified parts.

Continued

Table 4–6 Fast Facts for a Comprehensive ECG Assessment —cont'd		
CARDIAC CYCLE	**PROPERTIES**	**NORMAL (Fig. 4–3)**
T wave	The latter phase of ventricular depolarization	Rounded, asymmetric (peak closer to end of the wave than the beginning) positive in lead II with an amplitude less than 5 mm
Refractory period Divided into: Absolute refractory period Relative refractory period	Time during cardiac cycle when cardiac cells may or may not be depolarized by an electrical stimulus (depends on strength of impulse) From QRS to peak of T wave: Cardiac cells have not repolarized to their threshold; cannot be stimulated to depolarize (electrical cells cannot conduct impulse and myocardial cells cannot contract) Begins at peak of T wave to end of T wave: Cardiac cells have repolarized sufficiently to respond to a strong stimulus (e.g., PVC contraction)	
QT interval	Time between onset of ventricular depolarization and end of ventricular repolarization	From beginning of QRS complex to end of T wave; normal is corrected for heart rate but usually less than half of R-R interval
U wave	Further repolarization	Small, rounded; less than 2 mm in height and deflection is same as T wave
ECG	**PROPERTIES**	
ECG	Propagation of electrical impulses from cell to cell produces an electric current, which can be detected by skin electrodes and recorded as waves or deflections on graph paper	
Lead	A monitor lead provides a view of the heart's electrical activity between two points or poles (positive and negative)	

Table 4–6 Fast Facts for a Comprehensive ECG Assessment —cont'd

ECG	PROPERTIES
	Direction of current flow: Direction of wave form Toward positive pole: Positive deflection Toward negative pole: Negative deflection Perpendicular to pole: Positive and negative deflection
Paper	Horizontal lines: Duration of waveforms in seconds of time (each small square = 0.04 sec) (each small square measured vertically = 1 mm in height) Vertical lines: Voltage or amplitude of waveforms in mm
ANALYSIS OF RHYTHM STRIP	**PROCEDURE**
Determine regularity or rhythm of R waves	Measure R wave to R wave across strip Variation of 0.12 sec in R-wave regularity = irregular rhythm
Calculate heart rate	Regular rhythms: Equal distance on all R-R intervals Rapid rate calculation: Count number of R waves in a 6-second strip and multiply by 10 = heart rate per minute Precise rate calculation: Count number of small squares between two consecutive R waves and use conversion chart (300, 150, 100, 75, 60, 50, 43, 38, 33, 30, 27, 25, 23, 21, 19, 18, 16) *or* divide number of small squares between two consecutive R waves into 1500
Identify and examine P waves	One P wave should precede each QRS complex and all should be identical (or near identical) in size, shape, and position
Measure PR interval	Measure from beginning of P wave as it leaves baseline to beginning of QRS complex
Measure QRS complex	Measure from beginning of QRS as it leaves baseline until end of QRS when ST segment begins
Based on above analysis, interpret rhythm	Interpret rhythm

Continued

Table 4–6 Fast Facts for a Comprehensive ECG Assessment —cont'd

ANALYSIS OF RHYTHM STRIP	PROCEDURE
ECG interpretation Summary	Rate: Measure with rapid rate or precise rate calculation Rhythm: P before QRS; P-R interval, QRS interval; measure R-R with calipers Axis: QRS above or below baseline Hypertrophy: V1—Check P wave, R wave, S wave for various areas Infarction: Check all leads for Q waves, inverted T waves, ST segment depression or elevation

Created by Dana D. Daughtry, BSN RN; adapted from *ECG Workout: Exercises in Arrhythmia Interpretation*, 2005, 5th ed.

- Sinus rhythm = regular rhythm and rate 60–100 beats per minute and regular
- Sinus tachycardia = regular rhythm and rate >100 beats per minute
- Sinus bradycardia = regular rhythm and rate <60 beats per minute
- Sinus arrhythmia = varies with respiratory phase
- Atrial fibrillation = irregular ventricular rhythm with no P waves
- SA node dysfunction = sinus block, sick sinus syndrome
- Premature beats = premature atrial contractions (PACs), premature ventricular contractions (PVCs)
- Tachyarrhythmias = PACs, PVCs; flutter, fibrillation
- Sinus blocks = AV blocks, bundle branch block, hemiblock
- Dissociated rhythms = independent atrial and ventricular rates

3. Complete/abnormal complexes
   - For each complex is there a P wave?
   - For each complex is there a QRS wave?
   - Flat P wave
   - Long P-R interval
   - F or f waves
   - Wide QRS complex

4. Axis (electrical)
   - Check if QRS complex is positive or negative in lead I and AVF (up in lead I and AVF = normal; down in lead I and AVF = bad)
5. Hypertrophy
   - Check V1 lead (P wave for atrial hypertrophy, R wave for right ventricular hypertrophy, S-wave depth, positive R-wave height in V5 for left ventricular hypertrophy)
6. Infarction
   - Presence of Q wave = necrosis
   - ST segment elevation = injury, acute (with Q waves = acute, recent infarct)
   - ST segment depression that persists = subendocardial infarction
   - T-wave inversion = ischemia (often found with Q-wave or ST-segment elevation)
   - Compare with previous ECGs if available

Chapter Summary

This chapter presented common diagnostics that are critical to your competent practice. The next chapter presents key features of patient care. The content emphasizes critical skills, patient safety, and management of machines.

CHAPTER 5

Patient Care: Reviewing Critical Skills, Keeping Patients Safe, and Managing Machines

In Chapter 1, we provided a list of basic nursing skills, grouped according to the nursing process, that a generalist nurse should be comfortable performing after completing nursing school. This chapter is an overview of selected critical skills that nurses perform. Competence in these skills is expected, but becoming expert in performing any nursing skill requires time and experience. Therefore, for these skills we provide a detailed review with expert tips to accelerate your mastery. Ultimately, your own repetition, refinement, and reflection contribute more in the development of skill expertise.

Beginning in Chapter 1 we emphasized that the nursing process is applicable in all care settings and to all patient populations. As we also noted, the steps of the nursing process follow the mnemonic ADOPIE. Nurses habitually begin their patient care with a relevant *A*ssessment. Using critical thinking and clinical judgment, they develop a nursing *D*iagnosis and identify *O*utcomes that guide their path to the desired end. With this perspective, they *P*lan and *I*mplement targeted interventions. After they initiate any

therapeutic intervention, nurses *E*valuate their actions and their patient's response. The cycle of the nursing process continues with re-*A*ssessment.

One of the nurse's main activities in patient care is to provide or supervise therapeutic interventions using nursing skills. Nursing skills are often the "hands-on" part of nursing care, but these technical skills are not all that a nurse does. Critical analysis of clinical situations may be invisible, but it is the foundation for safe and effective nursing skills.

In a recent research study, senior nursing students cited nine skills, listed below, with which they needed more help and repetition to be ready for professional nursing practice. In our experience, newly practicing nurses and their preceptors also need more guidance with these skills. Therefore, for each skill, we review the procedure and add comments to emphasize safety or other important considerations.

- Starting an intravenous (IV) infusion
- Inserting a nasogastric tube (NGT)
- Inserting an indwelling (Foley) urinary catheter
- Administering a blood transfusion
- Mixing two types of insulin
- Performing tracheostomy care
- Taking orthostatic vital signs
- Performing an electrocardiogram (ECG)
- Managing basic bedside monitoring

Starting an Intravenous (IV) Infusion

Although starting an IV infusion is a common nursing intervention, it has many important aspects that relate directly to patient safety. IV infusions may be used for various fluids, medications, or diagnostic solutions (dye). An IV tube is a direct external connection to the internal circulatory system; proper insertion, maintenance, and monitoring are important to protect patients from infection. It is critical to correctly administer medications through an IV line because the drug quickly disperses through the circulatory system. Starting IV lines on pediatric patients requires special training and, unlike in adults, sites in the scalp, leg, or feet are often used. Table 5–1 outlines the steps used for a typical IV insertion in an adult.

Inserting a Nasogastric Tube (NGT)

An NGT is a flexible plastic tube that passes through the nose, down the esophagus, and into the stomach. The NGT may facilitate:

- Infusing nutritional fluids
- Draining air or gastric secretions

CLINICAL VOICE: FINELY HONED NURSING SKILLS

It was still early into the beginning of another night shift when the child arrived at the triage area of our community hospital's ER. He was being carried by his father. The mother was hovering close by. The parents were very anxious and the child was listless and lethargic. They were from Vietnam and their English was minimal, adding to our difficulty in finding out what was going on. The child was moved immediately to our critical care room.

The 4-year old had been sick for the past 4 days with vomiting, diarrhea, and fever. The parents had tried to treat their son as best they could; however, the child continued to get worse. He was lethargic, pale, non-responsive, and flaccid. I immediately called the ER physician and started setting up for an IV. Starting an IV is a routine I've done a thousand times, and it sometimes seems the basic nursing skills we do every day are just practice for the one time it will really make a difference. As the physician entered the room he recognized the severity of the child's condition and after my first attempt at inserting an IV failed, he tried to find access. Two IO attempts and two punctures left us still without any access. I can remember the intense focus I had as I looked at the hand of the child and knew I could "get a line in." A few moments later and we were pushing fluid through the IV tubing in the child's hand and breathing a big sigh of relief that we could now revive the child.

Soon, the pediatrician on-call arrived and arranged for transport of the child to the children's hospital in a nearby city where I also worked part-time in the ER. By calling to their ICU later that night, I learned the child was doing fine. I can't say if the IV I started saved the child's life, but I do know it made a difference.

Reproduced with permission from Laustsen, G. (2005). Finely honed nursing skills. In S. Hudacek (Ed.), Making a difference: Stories from the point of care (Vol. 1, pp. 173–174). Indianapolis: Sigma Theta Tau International.

Table 5–1 Starting an IV Infusion

IV start kit (if available) *or:*
Tourniquet
Cleansing and antiseptic preparations
Dressings/transparent dressing (Opsite)
Small roll of sterile tape
Appropriate catheter for venipuncture: Determine size (gauge) by vein quality and size and anticipated infusion solutions; typical sizes for adults are 18-g or 20-g (higher number = smaller catheter size)
IV solution (if applicable)
IV tubing or pump and administration set (if applicable)
IV pole, rolling or ceiling-mounted

Continued

Table 5–1 Starting an IV Infusion—cont'd

IV loop or short piece of extension tubing with 1–3 mL of sterile normal saline or heparin flush solution (per facility protocol) in syringe
Blood collection apparatus: e.g., Vacutainer and blood tubes (if applicable)

ACTION STEPS	IMPORTANT NOTES
Verify the order and gather needed equipment and supplies. Wash your hands and explain the procedure to the patient.	The size of the IV catheter may depend on expected therapeutics (e.g., blood administration or fluid rate). Having appropriate supplies at the bedside, such as extra needles or other equipment, allows you to be ready for multiple IV attempts. Many facilities use a prepackaged IV starter kit or have IV trays with needed supplies. The physician or advanced practice nurse will order the specific IV solution and flow rate. Make sure patients understand the purpose of their IV and how it will feel. Reinforce the need for their cooperation and not to move their extremity during the procedure.
Apply a tourniquet above the potential insertion site. Visualize and palpate for an appropriate vein.	The tourniquet should be tight enough to block venous return. Keep the tourniquet flat on the skin or on top of the patient gown. Put the arm in a dependent position. Warm towels may help distend veins if they are difficult to find. Having the patient open and close the fist may also help. Locating an IV has many considerations. Nurses who excel at starting IV lines rely more on feeling for the vein than looking for one. They also apply knowledge of anatomy, physiology, and pathophysiology as they look for potential IV sites. Pick the nondominant arm if possible. Ask if the patient has had any lymph-node surgeries (e.g., mastectomy) on the arm; use the other arm if there is any concern about lymph system function in the arm. Try to find a site that allows the patient to have use of the hands. A site in the forearm (not on the medial aspect) is typically best. Avoid the wrist and antecubital (AC) areas. Try to find a vein that is straight and without junctions and that will accommodate the size IV catheter needed. Use a fingernail or pen top to make a small indentation at the preferred insertion site.

Table 5–1 Starting an IV Infusion—cont'd

ACTION STEPS	IMPORTANT NOTES
Release the tourniquet, prepare the equipment, reapply the tourniquet, don clean gloves, and clean the site (Fig. 5–1).	Leaving a tourniquet on for an extended time is painful for the patient and may alter laboratory results due to hemolysis. Place supplies within reach of one hand. If the patient is being readied for an IV fluid, prepare tubing and pump for immediate connection. Once equipment is ready, don clean gloves, and clean insertion site per facility protocol, which may involve specific cleansing solutions (e.g., alcohol wipes or povidone iodine). Wipe in a circular motion from the center outward. Once the site is clean, do not touch this area again.
Insert the IV catheter (Fig. 5–2).	Using your nondominant hand, pull the skin taut about 2" below the expected insertion site. Hold the IV needle hub in your dominant thumb and forefinger at a 10°–30° angle and bevel up. Insert the needle with a firm, smooth motion through the skin. When entering the vein, you may feel a "pop" or a change in resistance.

FIGURE 5-1: Cleaning IV insertion site.

FIGURE 5-2: Inserting over-the-needle catheter.

Continued

Table 5–1 Starting an IV Infusion—cont'd	
ACTION STEPS	**IMPORTANT NOTES**
	Lower the angle, and advance the needle slightly into the vein. Look for blood return in the catheter chamber. Keep the needle steady and, with your nondominant hand, advance the catheter into the vein to the hub. Release the tourniquet. Retract or remove the needle from the catheter while applying pressure on the skin above the end of the catheter. Attach IV tubing or an extension set. Test for flow through the tubing or, if using an extension set, flush with 3–5 mL of saline. Evaluate the insertion site for any signs of edema or infiltration. Dispose of IV needle in the closest sharps container.
Secure the IV catheter to the skin (Fig. 5–3).	Continue to hold the IV catheter hub and tubing securely. Clean with an alcohol swab any blood that may be near the insertion site. Secure the IV site as per protocol for your facility. Typically, a clear, adhesive-backed covering (e.g., Opsite) is placed on the skin over the IV hub and insertion site. Loop the IV tubing up along the arm, and secure with nonallergenic tape.
Document the procedure, and monitor the IV site.	Document in the patient record the date and time of IV placement. Include the size of the IV catheter and its location and how the patient tolerated the procedure. Monitor the IV site for signs of infection. If infusing fluids or medications, monitor for signs of infiltration.

FIGURE 5-3: Securing catheter and labeling site.

- Irrigating the stomach
- Monitoring gastric bleeding

NGT sizes range from 5 (small) to 18 (large) French. For adults, sizes 12 and above are typically used for stomach decompression or removal of gastric secretions. For long-term feeding, a smaller, specially designed NGT with a stylet (e.g., Dobhoff) is typically used. A critical aspect of NGT placement is verifying the tube is in the correct location. A misplaced NGT, for example in a lung, can result in serious patient harm if fluids are infused. Table 5–2 outlines the steps for inserting an NGT.

Table 5–2 Inserting an NGT

NGT: Appropriate size (8–18 Fr) for patient (see NGT sizing below)
Nonallergenic tape (1") or NGT anchoring device
Toomey syringe (20–60 mL)
Tincture of benzoin
Gloves (clean)
Water-soluble lubricant or topical anesthetic lubricant (Lidocaine)
pH paper
Safety pin
Cup of water and straw
Emesis basin
Penlight/flashlight
Stethoscope
Tissues
Tongue depressor
Wall or portable suction setup if ordered

NGT Sizing
Adult: 14–18 Fr
To estimate NGT size for a pediatric patient, add 16 to the patient's age, and divide sum by 2. Choose a size closest to this value based on what is available. For example:
8 years old + 16/2 = 12 Fr
4 years old + 16/2 = 10 Fr
Infants: 5 or 8 Fr

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient.	Verify the reason the patient needs an NGT. The physician will order the correct type of NGT depending on purpose (feeding or decompression). The selection of NGT size is based on the size and age of the patient and the purpose for the NGT.

Continued

Table 5–2 Inserting an NGT—cont'd

ACTION STEPS	IMPORTANT NOTES
	NGT placement is often very uncomfortable for patients, although it should not be painful. Providing accurate information and answering patient questions can help decrease anxiety associated with this procedure. Especially inform patients not to pull the NGT out.
Assist the patient to a high Fowler's position (head of bed >45°). Ask the patient about any history of nasal surgery or trauma. Visually inspect each nasal vestibule for patency and an intact septum.	Upright positioning of the patient facilitates NGT placement and swallowing. Trauma or surgery of the nose may alter the ability of the NGT to pass through the nose. Establish a signal (e.g., patting own thigh with the hand) that the patient can use to signal you to pause the insertion.
Measure the NGT for length of insertion. Place the NGT end at the tip of the patient's nose, extend to the earlobe, and then to the xiphoid process. Mark this location with tape, or note the length mark on the NGT (Fig. 5–4).	The NGT needs to end in the patient's stomach, and this measurement will give you a close estimate of how far to insert the tube.

FIGURE 5-4: Measuring NGT for correct placement length.

Table 5–2 Inserting an NGT—cont'd

ACTION STEPS	IMPORTANT NOTES
Give the patient a cup of water with a straw (if the patient may have fluids). Have facial tissues available for the patient. Keep an emesis basin nearby.	Having the patient sip water through a straw when asked will help advance the tube past the epiglottis. NGT placement often causes the patient's eyes to water, so use facial tissues to wipe away any tears. NGT placement may initiate gagging or vomiting.
Don clean gloves. Lubricate the tip of the NGT with water-soluble lubricant or anesthetic gel. Twist the tip of the NGT around your fingers to make a curl.	Lubrication with an anesthetic gel may provide some temporary numbing to the nasal mucosa. Some institutions may require a physician order before using anesthetic gel. Twisting the NGT will help shape it to curve through the nasopharynx.
Have the patient raise his or her head up, and insert the NGT gently in an upward and backward direction. Do not use excessive force. Pause insertion when the tube reaches the pharynx.	Positioning the head of the patient helps straighten the nasal passage. Anticipate stimulating the gag reflex when the tube reaches the back of the oropharynx. Have the patient "pant like a puppy dog," which helps reduce gagging.
Have the patient lean his or her head forward to touch chin to chest. Advance the tube downward while the patient either swallows or sips water through a straw. Stop insertion if the patient needs a moment to breathe. Continue insertion until you reach the tape or mark on the NGT (Fig. 5–5).	Moving the head forward opens the esophagus, and swallowing helps to advance the tube. If the patient has excessive gagging or coughing, the tube may be curling in the back of the throat. If the patient experiences prolonged gagging, coughing, or dyspnea, remove the NGT immediately. Visualize the area with a penlight and tongue depressor. Twisting or rolling the tube between the fingers during insertion may help advance it. If gagging persists, remove the NGT. Once the NGT is in the stomach, gastric contents may start draining out. Connect the NGT to suction if ordered, or place the tip into an emesis basin.
Holding the NGT with one hand, aspirate stomach contents, and check the pH. Check centimeter markings on the NGT at the edge of the naris.	Stomach contents should be acidic (pH ≤4). Before taping, note the length measurement on the NGT at the edge of the naris. The NGT can migrate outward with time.

Continued

Table 5–2 Inserting an NGT—cont'd

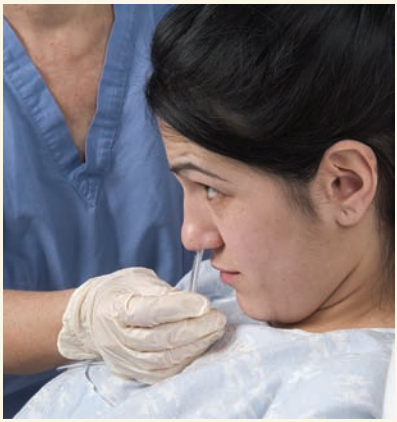
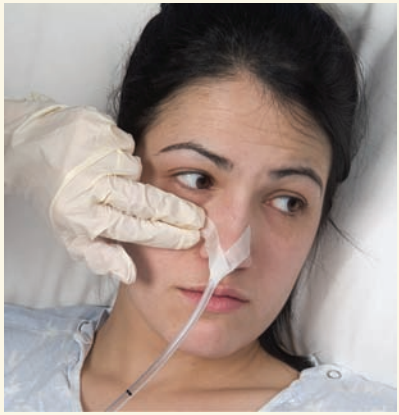
ACTION STEPS	IMPORTANT NOTES
 **FIGURE 5-5:** Lean head forward after NGT reaches the posterior pharynx.	
Secure the NGT. Paint a small amount of tincture of benzoin on the nose. Split the bottom 1"–2" of a piece of nonallergenic tape 3"–4" long. Attach the unsplit end to the patient's nose. Wrap each split end around the NGT so that the tube is not against the skin of the naris. Secure the NGT to the patient's gown by attaching a safety pin through a piece of tape wrapped around the NGT. Use an NGT anchoring device if available (Fig. 5–6).	Benzoin helps keep the tape in place longer. Be careful not to get benzoin in the patient's eyes. Keep the NGT away from the edge of the nose to prevent tissue damage from rubbing. Attaching the NGT to the patient's gown minimizes the risk of snagging and pulling out the tube.

Table 5–2 Inserting an NGT—cont'd

ACTION STEPS	IMPORTANT NOTES
 **FIGURE 5-6:** Securing NGT.	
Connect the NGT to appropriate suction (if ordered). If a double-lumen NGT is used, place the vent cap into the vent tube. Order a chest x-ray to verify correct NGT placement before instilling anything in the tube. Document the procedure and the patient's response.	Physicians will order either continuous or intermittent suction (depending on tube type) for patients requiring removal of gastric secretions. A chest x-ray is the standard method for verifying correct placement of the NGT. You should receive confirmation from the physician or radiologist of correct tube placement before instilling anything through the NGT. Document in the patient record the size of the NGT, length of insertion, quantity and color of gastric contents, and how the patient tolerated the procedure.

Inserting an Indwelling (Foley) Urinary Catheter

Many hospitalized patients require a temporary indwelling urinary catheter, often referred to by the brand name Foley. An indwelling urinary catheter:

- Allows drainage of urine if the patient cannot ambulate to the toilet or has urinary retention or incontinence.
- Facilitates bladder irrigation post surgery.

- Allows for monitoring of urinary output and the collection of urine samples for diagnostic purposes.
- May be used to instill fluid or dye for diagnostic purposes or warm fluid for treating hypothermic patients.

Placement of a urinary catheter is an invasive procedure that is susceptible to causing iatrogenic infections, so it is important for the nurse to perform the procedure with meticulous sterile technique. The size of the catheter chosen depends on patient size and reason for the catheter. Large catheters are common when irrigating the bladder after genitourinary surgery to allow passage of blood clots. Table 5–3 outlines the steps for inserting an indwelling (Foley) urinary catheter.

Table 5–3 Inserting a Foley Catheter

Sterile urinary catheterization kit (kits may vary in their contents; the nurse should verify needed supplies for the procedure)
Gloves (extra pair or package of correct size sterile gloves)
Drapes, one fenestrated
Lubricant
Antiseptic cleansing solution
Cotton balls
Forceps
Prefilled syringe with sterile water (inflates catheter balloon)
Catheter of correct size and type for procedure (extra catheters of same and smaller/larger sizes) (see important notes on appropriate size)
Sterile drainage tubing with collection bag
Velcro leg tube-holder or tape, safety pin, and elastic band
Specimen container
Blanket

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient.	Choose the equipment based on the patient's expected urethral size and the reason for the catheter. General size guidelines: 14–16 Fr for adult women 12 Fr may be considered for young girls 16–18 Fr for adult males A physician may order a larger size for specific purposes (e.g., continuous bladder irrigation after surgery) or a smaller size for infants and small children.

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES
Assess for allergies to antiseptic, tape, latex, and lubricant. Assess recent urinary symptoms or problems. Request assistance from another nurse or ancillary staff. Request others to leave the room, close the door, and draw the curtain.	Many patients are allergic to iodine-based cleaning solutions. Ask the patient about any past genital surgeries or previous experiences with catheters. Another nurse or medical assistant can be helpful with holding the patient's legs apart and aiding with equipment or the procedure itself. Patients generally desire privacy during this procedure.
Raise the bed to a comfortable working height. A right-handed nurse should do the procedure from the patient's right. Place the bedside stand with equipment at the end of the bed.	Typically, you insert the catheter while standing. The bed should be at a comfortable height. Generally, the head of the bed is flat or only slightly elevated.
Pull the bedding down to the foot of the bed. Position the patient with legs spread outwards, knees bent, and feet together. Place a waterproof pad under the patient. Drape the patient with a bath blanket.	Appropriate positioning provides good visualization of the perineum area. Patients may need pillows or assistive personnel to support their legs. A warm blanket provides comfort and modesty for patients.
Wear clean gloves to wash and dry the perineal area. Remove gloves, and repeat hand hygiene.	Many patients may have soiled perineal areas due to incontinence or inability to perform adequate cleaning. Use warm, soapy water to clean the perineum, and dry well.
Open the catheterization kit on the bedside stand, maintaining a sterile field on the inner surface of the packaging.	The catheterization kit is often opened on a bedside stand but later transferred to the sterile pad on the bed. Maintain the sterility of the tray's bottom surface when opening the kit.
Place the underpad beneath the patient's buttocks. Don sterile gloves from the kit.	An underpad may or may not be in the tray. If not, use a clean, disposable underpad to protect the bedding under the patient. Check the size of the sterile gloves in the kit, and bring a package of the appropriate size if the kit gloves are too small.

Continued

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES
Open the sterile package containing the catheter. Open the package, and pour sterile antiseptic solution into the compartment with the sterile cotton balls. Open the lubricant packet. Set the specimen container aside. Attach the prefilled syringe to the catheter, and test the balloon by injecting fluid into the balloon port. Lubricate the catheter tip to a depth of 1"–2".	Check the catheter for integrity and kinks. Test the balloon by attaching the syringe with sterile water and inflating the balloon. Withdraw the water back into the syringe, and leave the syringe attached to the catheter. Squeeze the lubricant into the tray or, once open, place the packet over the end of the catheter.
Place the sterile drape on the bed between the patient's thighs, taking care not to touch any contaminated surface with sterile gloves. Place the fenestrated sterile drape over the perineum, exposing the patient's genitalia. Place the sterile tray and its contents on the sterile drape.	When placing the sterile drape, be careful not to touch the patient's legs or the bed with your sterile gloves. A fenestrated drape has a hole that opens over the genitalia. Move the tray to the sterile drape on the bed, being careful not to have it touch the patient's legs.
Female Catheterization	
With your nondominant hand, spread the labia to expose the urethral meatus, and hold this position throughout the procedure. With your dominant hand, use the forceps to pick up a cotton ball saturated with antiseptic solution. Clean the perineal area using a new cotton ball for each area. Wipe from front to back, clean the outer labial fold on each side, and then clean directly over the urethral meatus (Fig. 5–7).	Carefully position your nondominant hand, and spread the labia. This hand is now contaminated and needs to remain in place until the procedure is accomplished. After cleaning these areas, they become slippery, and it is difficult to re-spread the labia. Dispose of used cotton balls (after each wiping) away from the sterile field.

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES
Pick up the lubricated catheter with your gloved dominant hand about 3"–4" from the catheter tip. Ask the patient to bear down gently as if to void, and slowly insert the catheter through the urethral meatus. Advance the catheter 2"–3" or until urine flows. When urine appears, advance the catheter 1"–2" more. Do not force the catheter against resistance (Fig. 5–8).	Hold the catheter in your palm and the catheter tip with your thumb and index finger. Insert the catheter into the urinary meatus. If no urine appears, check if the catheter entered the vaginal opening below the meatus. If misplaced, leave the catheter in the vagina as a landmark indicating where *not* to insert. In a sterile manner, the assistant can open an extra catheter for the nurse to repeat this insertion step. Keep the labia apart by not removing the nondominant hand.

FIGURE 5-7: Cleaning perineal area.

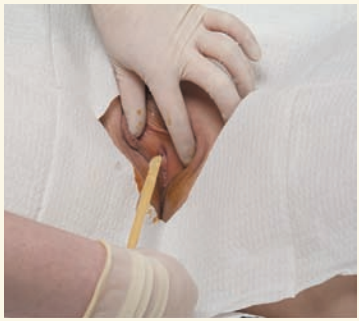


FIGURE 5-8: Inserting catheter into urinary meatus.

Continued

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES
Release the labia. Hold the catheter with your nondominant hand, and inflate the balloon with the prefilled syringe. Release the catheter, and tug gently.	Inflation of the balloon anchors the catheter tip in place above the bladder outlet to prevent removal of the catheter. Note the size of the balloon on the catheter. A 5-mL balloon is most commonly used, and a prefilled syringe is included with the kit. Use only the amount included. Do not overinflate the balloon. If you meet resistance during filling with the syringe, try advancing the catheter slightly. After filling the balloon, remove the syringe. Check that the catheter is secure in the bladder.
Secure the catheter tubing to the patient's inner thigh with a strip of nonallergenic tape or Velcro tube holders. Allow some slack in the tubing. Wash and dry the perineal area as needed to remove excess antiseptic solution (Fig. 5–9).	Velcro tube holders are more secure and less irritating than tape for securing catheter tubing.

FIGURE 5-9: Securing catheter to thigh.

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES
Determine there is no urine leaking from the catheter or tubing connections. Document the procedure.	Assess the meatus area for signs of urine leakage or skin irritation, breakdown, or infection. Document in the patient record the size and type of catheter used, the initial amount of urine that drained out, and how the patient tolerated the procedure.
Male Catheterization	
Follow all steps in preceding Female Catheterization.	
Lift the patient's penis (upright in relation to the pelvis) with your nondominant hand, and retract the foreskin if the patient is uncircumcised. Use the forceps and three soaked cotton balls to clean the tip of the penis. Use a circular motion, and work outward from the meatus.	The nondominant hand is now considered contaminated.
Pick up the lubricated catheter with your gloved dominant hand about 3"–4" from the catheter tip. Ask the patient to bear down gently as if to void, and slowly insert the catheter through the urethral meatus. Advance the catheter 6"–8" or until urine flows. When urine appears, advance the catheter 1"–2" more. Do not force the catheter against resistance (Fig. 5–10).	Some catheter trays have a syringe with lubricant that can be inserted directly into the meatus. Some resistance will usually be felt at the area of the prostate, especially in older males. Twisting the catheter slightly during insertion may help it pass through the sphincters.
Release the penis, and hold the catheter with your nondominant hand. Inflate the balloon with the prefilled syringe. Release the catheter, and tug gently.	
Follow the final two steps under preceding Female Catheterization.	In some males, securing the catheter with the penis directed toward the chest is more comfortable.

Continued

Table 5–3 Inserting a Foley Catheter—cont'd

ACTION STEPS	IMPORTANT NOTES

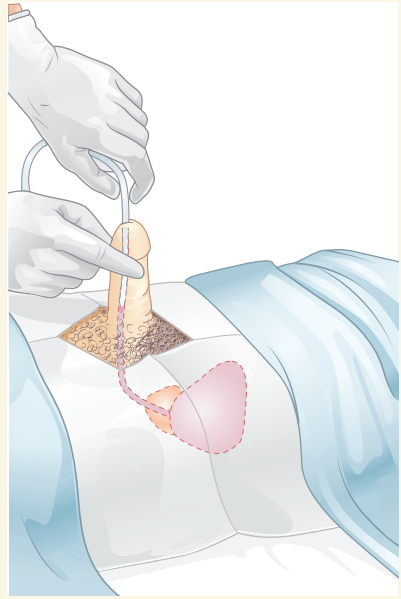


FIGURE 5-10: Inserting catheter in a male.

Administering a Blood Transfusion

Patients who have had significant blood loss from trauma, surgery, or internal bleeding may receive blood transfusions in addition to resuscitative crystalloid fluids. Blood products transfused may include whole blood, plasma, red blood cells (RBCs), or platelets. Protocols for transfusion of blood vary, and the nurse should always follow the individual institution's policy and procedures. For adults, blood should be infused through an IV line at least 20 g and preferably larger (18 g or 16 g). Frequent assessment of patients, during and after receiving blood products, is essential for monitoring for possible transfusion reactions. Table 5–4 outlines the steps for administering a blood transfusion.

Table 5–4 Administering a Blood Transfusion

Blood product
Blood administration set (tubing with in-line filter and Y connector to saline)
250–500 mL normal (0.9%) saline solution
Gloves
Transfusion documentation forms
Optional: Additional 1000 mL normal saline, tubing, and Y connector

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient. Verify the blood product and number of units or volume to be infused. Explain the procedure to the patient, and ask about any previous blood product transfusions and reactions.	Verify the correct time and date for infusion and type and amount of blood product ready for transfusion. Transfusion reactions are a potentially serious adverse event to blood product administration.
Verify patency of the current IV line. Administer any pre-transfusion medications if ordered.	Flush the existing IV catheter with 3–5 mL of normal saline to verify patency. If the flow of the IV flush is slow or restricted, consider starting a new IV line. Physicians may order medications to minimize or prevent a transfusion reaction for patients with a history or potential for a transfusion reaction.
For whole blood, RBCs, or granulocytes, verify in the computer or with the blood bank: blood grouping, Rh type, number of units crossmatched, and number of units set up.	Administer the correct blood group and Rh type to avoid a transfusion reaction.
Except for emergency transfusions, verify the patient has signed the informed consent. Check and verify the patient's hospital ID bracelet.	Administration of blood products requires informing the patient of risks and benefits of this procedure and having the patient sign a consent form acknowledging understanding of the procedure. This step may not be possible in emergency transfusions.

Continued

Table 5–4 Administering a Blood Transfusion—cont'd

ACTION STEPS	IMPORTANT NOTES
Obtain ordered blood product from the blood bank. Obtain baseline vital signs. Check the appearance of the blood product for the presence of clots, clumps, or abnormal cloudiness. Check the integrity of seals.	Administer blood products within 30 minutes of their leaving the blood bank refrigerator. Usually only one unit is released at a time. *Do not* place blood products from the blood bank in the refrigerator on the patient care unit. Return any blood products with an unusual appearance to the blood bank.
Before administration, two nurses trained in blood administration procedures compare (1) the blood product from the blood bank with the product requested in the physician's order; (2) blood type and Rh type recorded for the patient with the container bag and label, verifying that they are identical or compatible; (3) the blood product number on the blood bag with the product number on the blood bag tag; and (4) the expiration date and time on the blood container label with the current date and time (Fig. 5–11).	All records must correspond exactly. All identification attached to the blood container bag must remain attached until completion of the transfusion.

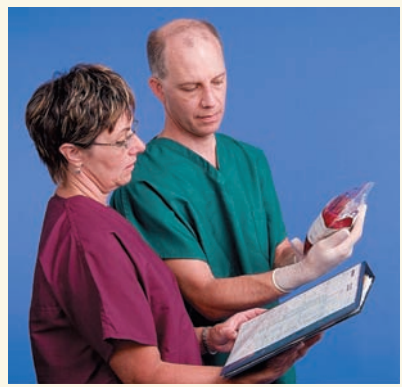


FIGURE 5-11: Verifying blood product with two RNs.

Table 5–4 Administering a Blood Transfusion—cont'd

ACTION STEPS	IMPORTANT NOTES
In the presence of the recipient and immediately before the transfusion, two nurses identify the patient using at least two forms of identification: (1) compare and verify the patient's name and medical record number on the blood unit with the recipient's identification bracelet and the information recorded in the patient record; (2) ask the patient to state his or her name.	Wrong patient, wrong blood product, and other identification errors are the most common causes of adverse transfusion events. Checking for the correct patient is a *critical* step in the transfusion process. For any discrepancy, notify the blood bank, and return the blood product until the problem is resolved.
Prime the blood tubing administration set with the blood product or normal saline (Fig. 5–12).	Consider adding a three-way stopcock onto the end of the blood administration set, and have a bag of normal saline and IV tubing available for emergency use or attached to the stopcock. Use a blood warmer if needed. *Do not* microwave blood products.

FIGURE 5-12: Priming blood tubing.

Continued

Table 5–4 Administering a Blood Transfusion—cont'd	
ACTION STEPS	**IMPORTANT NOTES**
For adults, adjust the rate of flow to 2–5 mL/min for the first 5 minutes for platelet or plasma infusions or 2 mL/min for the first 15 minutes for whole blood, RBCs, or granulocytes. Observe the patient closely for the first 15 minutes.	An infusion pump may facilitate administration of blood products. Adverse reactions usually occur during infusion of the initial 50 mL. Careful monitoring for a reaction can decrease patient complications or death. Typical reaction symptoms include flushing, dyspnea, itching, hives, and/or a rash.
After 15 minutes, obtain and record a full set of vital signs. If vital signs are within the normal range and the patient has no signs/symptoms of an adverse reaction, change the infusion rate to the physician-prescribed time period. Continue monitoring the patient for adverse reactions up to 1 hour post transfusion. If you suspect a transfusion reaction, immediately stop the transfusion. Maintain patency of the IV line by infusing normal saline, and notify the physician.	Adverse transfusion reactions can occur anytime during or after the transfusion. If a transfusion reaction occurs, do not discard the blood products. Save them for analysis.
After blood product transfusion, flush the blood administration set with normal saline until the tubing is clear. Obtain and document vital signs. Disconnect and discard the empty blood product bag into a biohazard receptacle. Document the transfusion in the patient record.	If required to administer additional transfusions, check the institution's policy about reusing blood tubing sets. Documentation should include the time and date of transfusion, the type and amount of blood product transfused, transfusion vital signs, and the patient's response to the transfusion. Patients should be monitored post-transfusion for the potential of fluid overload.

Mixing Two Types of Insulin

Diabetic patients may receive more than one type of insulin. Insulin types vary in their onset and duration of action and are generally classified as being short-, intermediate-, or long-acting. To minimize the need for multiple injections, nurses may mix two types of insulin in the same syringe. To maintain the integrity and avoid cross-contamination of the multi-use

vials of insulin, the nurse must follow the steps for drawing each insulin type. While completing this procedure, the nurse should be aware of the institution's policy regarding a second nurse's verification of the insulin type and dose. Neutral protamine Hagedorn (NPH) is the only long-acting insulin appropriate for mixing with short-acting insulins (i.e., regular, Lispro, aspartame, and glulisine insulins). Not all insulin types may be mixed:

- Lente insulins (Semilente, Lente, Ultralente) may be mixed with each other in any ratio.
- Lente and regular insulin should generally not be mixed with each other.
- Insulin glargine (Lantus) should not be mixed with any other insulin types.

See Table 5–5 for steps for mixing insulin.

Table 5–5 Mixing Insulin

Insulin syringe and needle: Syringe must be appropriate size for total amount of insulin. Vials of two insulin types.

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands.	Insulin comes in many forms, and diabetic patients are on a wide range of dosages. Make sure insulin types and amount are correct. Insulin syringes usually have the needle attached and come in various sizes (30, 50, and 100 units). Choose a syringe size that will contain the entire amount of both insulins and that you can read accurately. The needle length also varies; you should select a needle that reaches adequately into the subcutaneous space. Needles come in lengths of 3/16", 5/16", and 1/2".
For new vials, remove the plastic cap. For insulin suspensions (NPH), roll the vial between your hands to mix well. There is no need to roll or mix "clear" insulins. Set the insulin vials on a flat counter, and clean the tops of the vials with alcohol swabs.	Mix insulin in suspension before withdrawing it from the vial. NPH is the only insulin currently produced in suspension. Do not shake the vial.

Continued

Table 5–5 Mixing Insulin—cont'd

ACTION STEPS	IMPORTANT NOTES
Inject air into the non-regular insulin equal to the amount of units you will remove. Do not let the needle touch the vial contents. Touch the plunger knob only to avoid contamination of the syringe barrel. Withdraw the syringe from the non-regular insulin vial, and inject air into the regular insulin equal to the amount of units you will remove. Do not remove the needle (Fig. 5–13).	The goal in this technique is to prevent long-acting insulin from contaminating insulin in the short-acting vial. In the past, nurses used such phrases as "clear to cloudy" to remember the order for drawing up two types of insulin. Because newer long-acting insulins are not all cloudy, remember the phrase: "short to long" instead.

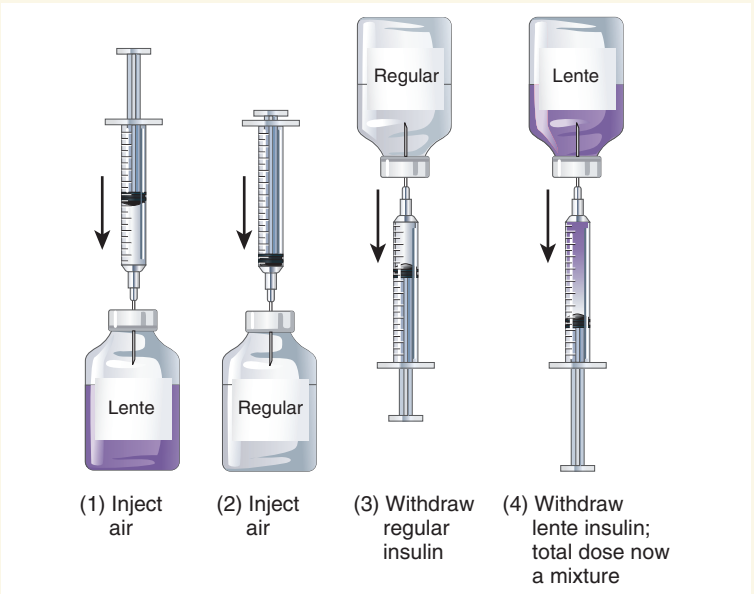


FIGURE 5-13: Technique for mixing two types of insulin.

Table 5–5 Mixing Insulin—cont'd	
ACTION STEPS	**IMPORTANT NOTES**
Invert the regular insulin vial, and remove the ordered amount of regular insulin. Have a second nurse verify the correct insulin type and dose. Remove the needle from the regular insulin vial, insert it into the non-regular insulin vial, invert, and withdraw the ordered amount of non-insulin into the syringe. Again, have a second nurse verify the correct insulin type and dose (see Fig. 5–13).	Because of the significant action of insulin and potential for error in drawing up the drug, institutions generally require two nurses to check insulin doses before injecting them into the patient. The needle must stay in the bottle until the second nurse has verified the type *and* amount of insulin. Repeat this step after you draw up the second type of insulin.
Carefully recap the needle. Return the insulin vials to their appropriate storage location. Explain what you are doing, and administer the mixed insulin to the patient. Document the drug administration (see Fig. 5–13).	Unless you mix the insulins at the bedside, recap the needle. Using a recapping device or approved method protects you and others from an accidental needle-stick. Many facilities and patients keep insulin refrigerated, although it keeps at room temperature for up to 1 month after opening. Injection of room-temperature insulin is less irritating to the patient.

Performing Tracheostomy Care

A tracheostomy is a surgical opening of the trachea to provide and secure an open airway. A trained health-care professional inserts a tube in the anterior portion of the neck through a stoma in the cricoid cartilage, directly into the trachea. Patients may have a "trach" for a number of reasons:

- To provide an emergency airway when facial trauma or illness occludes the upper airway
- To provide a long-term or permanent airway in an intubated patient who does not have full respiratory ability

Unlike an endotracheal tube, a tracheostomy may allow the patient to talk and eat. The tracheostomy or trach tube is typically a curved plastic device (inner cannula) that inserts into a hard plastic outer cannula with a flat plastic collar or flange. The tube is available in many sizes and may be cuffed or uncuffed. An obturator fits into the inner cannula during insertion. Trach tape, a tie, or a padded strap around the neck secures the

trach tube. Patients with a tracheostomy need frequent care of the tube because the insertion site gives potential access for infection of the respiratory system. Tracheal tissue necrosis is also a potential problem associated with cuffed trach tubes. See Table 5–6 for steps used in performing tracheostomy care.

Table 5–6 Performing Tracheostomy Care

Towel
Tracheostomy suction supplies
Hydrogen peroxide
Normal saline (NS)
Scissors
Two sterile gloves
Face shield, if indicated
Sterile tracheostomy care kit, if available *or:*
Three sterile 4 × 4 gauze pads
Sterile cotton-tipped applicators
Sterile tracheostomy dressing
Sterile basin
Small sterile brush (or disposable cannula)
Tracheostomy ties (e.g., twill tape, manufactured tracheostomy ties, Velcro tracheostomy strap)

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient.	Patients with tracheostomy tubes are at increased risk for airway complications because normal protective mechanisms have been bypassed. Maintain aseptic technique during tracheostomy care.
Perform care as needed if the tube is unstable or has become soiled with excess secretions.	Removing any secretions will decrease potential aspiration or outer cannula blockage. Stabilize the tracheostomy tube during care to prevent dislodgment, injury, and/or discomfort.
Obtain a tracheostomy care kit and any additional supplies.	
Assess the patient's respiratory status.	Before, during, or after care, patients may experience oxygen desaturation. Keep appropriate oxygen delivery devices available, and consider using "blow-by" oxygen during the tracheostomy procedure.
Suction the tracheostomy, and remove the old dressing.	
Keep an oxygen source available during the procedure.	

Table 5–6 Performing Tracheostomy Care—cont'd

ACTION STEPS	IMPORTANT NOTES
Open two packages of cotton-tipped swabs. Add NS to one package and hydrogen peroxide to the other. Keep hydrogen peroxide and saline solutions open for future use. Open a sterile tracheostomy package. Unwrap a sterile basin, and pour a small amount of hydrogen peroxide into it. Open a small sterile brush package, and place it into the sterile basin. Don sterile gloves, and maintain sterility of your dominant hand.	Hydrogen peroxide solution helps loosen secretions. NS helps remove any potentially irritating hydrogen peroxide. Maintain sterility of solution bottles by not allowing the top of the bottle to touch any supplies or surfaces. Tracheostomy kits may contain sterile gloves; however, they may not be your size. Always have available at least one extra set of sterile gloves.
To replace a *disposable inner cannula,* do as follows. Remove new cannula from packaging (Fig. 5–14). Touching only the outer aspect of the tracheostomy tube, unlock and remove the old inner cannula, and replace it with the new one. Lock the new cannula into position.	Either after a certain period or with certain types of cannulas, replace the inner cannula rather than clean it. Follow guidelines of the physician, institution, or manufacturer for when to replace the inner cannula.

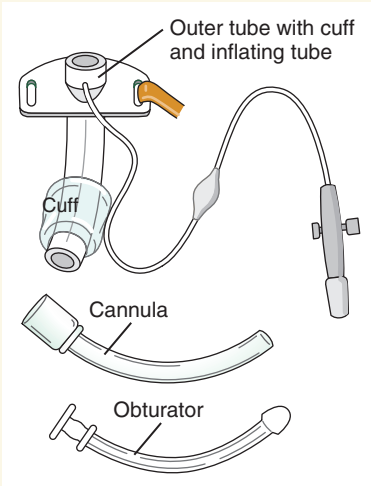


FIGURE 5-14: Disposable tracheostomy equipment.

Continued

Table 5–6 Performing Tracheostomy Care—cont'd	
ACTION STEPS	**IMPORTANT NOTES**
To clean a *nondisposable inner cannula,* do as follows. Touching only the outer aspect of the tracheostomy tube, unlock and remove the inner cannula, and place it in the hydrogen peroxide basin. Place an oxygen source over or near the outer cannula. Work quickly to clean the inner cannula to minimize the risk of oxygen desaturation. Use the small brush to remove secretions inside and outside the cannula. Hold the inner cannula, and pour normal saline over and through the cannula. Replace the inner cannula, and lock it into the collar. If applicable, reapply the oxygen delivery system (e.g., ventilator).	Ventilator or other oxygen delivery devices may not attach to a tracheostomy tube after removal of the inner cannula. After removing the inner cannula, clean the piece thoroughly *and* quickly. Patients may not be receiving fully effective oxygenation while the cannula is out.
Clean the stoma and outer surfaces of the tracheostomy tube and faceplate. Work outward from the stoma, using swabs and gauze soaked in hydrogen peroxide. Rinse all areas with swabs and gauze soaked in NS. Dry the skin and outer tracheostomy surfaces by patting them lightly with a 4 × 4 gauze pad.	Clean from the stoma area outward to minimize introducing infectious agents into the stoma opening. After cleaning, dry all wet surfaces to minimize growth of bacteria and to protect the skin from excoriation.
Replace ties and dressing. If available, have an assistant hold the tracheostomy tube, and cut the old ties. If assistance is not available, attach new ties before removing the old ones. Cut tracheostomy or twill tape on a diagonal with enough length to encircle the patient's neck two times: about 2–2½ feet for an adult. Insert the cut end into one side of the faceplate, and pull until the ends are about even. Slide the tie around behind the patient's neck,	Accidental extubation is a risk during care and especially while replacing ties. A new tracheostomy tube of the same size and obturator should be available at the patient's bedside in case of emergency replacement. Temporarily insert a size 6 endotracheal tube in the stoma if a replacement tube is not readily available. Making diagonal cuts on the end of the tracheostomy tie makes it easier to insert the tie through the eyelet. The slack allows space for the new tracheostomy dressing.

Table 5–6 Performing Tracheostomy Care—cont'd

ACTION STEPS	IMPORTANT NOTES
and thread the cut end through the other eyelet on the faceplate. Secure the ends of the tie with a double square knot, allowing enough slack between the tie and the neck for one finger. Cut any excess tie (Fig. 5–15). Replace the old tracheostomy dressing with a new dressing under the faceplate.	The dressing helps absorb secretions or drainage and minimizes pressure on the clavicle heads. Always use a tracheostomy-specific dressing. *Do not* take regular 4 × 4 gauze and cut a groove in it to slip around the tube. Small loose fibers from the cut edges may enter the patient's airway.
Reassess the patient's respiratory status, and compare findings with the patient's pre-procedure status. Assess other aspects of the patient's response, and document the procedure.	Monitor the patient's tolerance of the procedure and respiratory status (oxygen saturation via pulse oximetry, lung sounds, and respiratory rate and effort). Suction as needed after completing the procedure.

FIGURE 5-15: Securing Velcro tracheostomy tie.

Taking Orthostatic Vital Signs

Patients may become hypovolemic (volume-depleted) because of blood or plasma loss, dehydration, or dilation of peripheral blood vessels (e.g., in neurogenic shock). These patients are not able to compensate and maintain a stable heart rate (HR) and blood pressure (BP) when changing positions from supine to either sitting or standing. Taking orthostatic vital signs, sometimes called "posturals" or the tilt test, helps to identify patients who

may be hypovolemic. Orthostatic vital signs are not always definitive, and the changes in BP and pulse need to be considered in relation to the patient's past and current medical history, medication use, time of day, recent oral intake, and age.

The procedure for taking orthostatic vital signs lacks standardization. The recommended amount of time a patient should be supine before beginning the series of vital signs ranges 5–10 minutes. Likewise, the time between taking the BP and pulse in the various positions ranges 0–10 minutes. The literature supports taking the pressure immediately and then 2 minutes after the patient changes position (Lance, Link, Padua, et al., 2000).

Standards vary regarding the vital sign changes needed to consider a patient orthostatic or to have a positive tilt test. Some clinicians may use the 20-10-20 guideline to describe a positive test: a 20-point change in systolic BP, a 10-point change in diastolic BP, and a 20-point change in pulse rate. See Table 5–7 for steps in taking orthostatic vital signs.

Table 5–7 Taking Orthostatic Vital Signs

Stethoscope
Blood pressure cuff (appropriate size for patient's arm)
Sphygmomanometer or electronic BP device
Watch with second hand

ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient. Verify the BP cuff size is correct for the patient's arm diameter.	To avoid possible equipment errors, it is best to use the same equipment each time you take vital signs. BP cuffs that are the wrong size may give either falsely high or low readings. Explain the process to the patient. It is especially important that patients tell you if they feel dizzy, lightheaded, faint, or nauseated when changing positions. Patients may faint, fall, and hurt themselves while you obtain these vital signs.
Put the patient in a supine position for 10 minutes. If this position compromises respiratory function, raise the head of the bed slightly.	Keeping the patient supine for 10 minutes allows the BP to equilibrate to this position after the patient has been moved from a different position.

Table 5–7 Taking Orthostatic Vital Signs—cont'd	
ACTION STEPS	**IMPORTANT NOTES**
Place the BP cuff on the patient's arm, and either start the electronic device or take a manual BP. Take the patient's radial pulse rate, or read it from the electronic device.	Use the same arm and pulse site each time you take orthostatic vital signs. Electronic devices produce consistent results and avoid possible bias or poor technique of the person taking the vital signs.
Leave the BP cuff on, and assist the patient to the new position (sitting or standing). Repeat vital signs immediately and after 2 minutes. Ask the patient to report any dizziness, and monitor for clinical signs of near-syncope (e.g., pale skin, lack of response to questions). *Note:* If checking all three positions, assist the patient to a standing position, and repeat the vital signs immediately and at 2 minutes. Continue to monitor for clinical signs of near-syncope, and return the patient to bed if any risk of fainting.	Moving the patient from supine to standing and taking two readings is more common than taking a second reading while the patient is sitting and a third while standing. Some patients may not be able to stand, thereby requiring the second reading in a sitting position. Monitor the patient carefully while getting the vital signs. A patient may not warn of feeling faint before collapsing. Be especially careful with patients who are heavy or unsteady on their feet.
Document findings in the chart. Call the provider immediately if results are significant or if the patient experienced severe dizziness. Documentation may include line figures to represent the various positions. Document any subjective comments the patient makes.	Sample documentation with positive orthostatic vital signs:  BP = 140/80; HR = 64 (supine)  BP = 128/88; HR = 76 (sitting)  BP = 112/92; HR = 90 (standing) "I feel dizzy"

Performing an Electrocardiogram (ECG)

An ECG is a procedure that produces a printout (sometimes called a 12-lead) of the electrical activity of the heart. Recording an ECG involves placing multiple electrodes on each of a patient's four limbs and in specific locations on the chest wall (precordium). Each combination of electrodes used in standard

electrocardiography is called a lead. A 12-lead ECG creates a view of the heart's electrical impulses from 12 different combinations of leads and prints these waveforms on graph paper moving at a set rate through the ECG machine. An ECG recording represents a view of the heart's electrical activity for only a few seconds. Standard ECGs are also limited in that they do not show the right and posterior aspects of the heart very well. A 15- or 18-lead ECG is sometimes requested by the provider to look for possible involvement of the right ventricular and posterior aspects of the heart. A standardized ECG machine may be used for 15- or 18-lead ECGs by the nurse's repositioning of the six chest (V) leads.

Although many facilities have ECG "techs" who routinely perform ECGs, nurses should familiarize themselves with both performing and reading ECGs. A physician or advanced practice nurse is responsible for the official ECG interpretation. Nurses, especially in critical care areas, should be able to read and identify ECGs that indicate such serious problems as myocardial infarction (MI). Critical care areas typically require their nurses to attend classes in basic and advanced ECG interpretation. Table 5–8 outlines the steps for performing an ECG.

Managing Basic Bedside Monitoring

Whether used on an intermittent or continuous basis, a portable bedside monitor (Fig. 5–17) facilitates obtaining and recording basic patient parameters such as BP, HR, temperature, respiratory rate, oxygen saturation, and cardiac rhythm.

Nurses often print data directly from the machine for documentation purposes. Regardless of the reasons for using a bedside monitor, verify the following:

- Accuracy of readings: calibrate devices as needed, and verify movement-based data.
- Appropriateness of alarms: set appropriate minimum and maximum levels for each patient; turn alarms on for all devices in use.
- Agreement with actual patient status: acknowledge limitations of bedside monitors, verify placement of devices, and obtain subjective data.
- Box 5–1 outlines the basics of bedside monitoring.

Table 5–8 Performing an ECG

ECG machine
Self-adhesive, disposable monitor lead electrodes
Gauze pads
Extra blanket
Electric razor (optional)

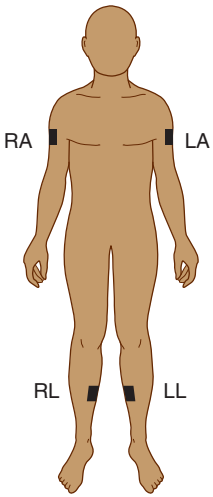
ACTION STEPS	IMPORTANT NOTES
Verify the order, and gather needed equipment and supplies. Wash your hands, and explain the procedure to the patient.	Many patients are unfamiliar with this procedure. The presence of so many wires can be concerning or even frightening. Reassure the patient that no electricity will be in the wires, which "read" the heart's electrical activity.
Position the patient supine, if possible, with arms at the sides and legs uncrossed. If the supine position causes respiratory difficulties, put the patient in a Fowler's or upright position. Close the room door or pull the bed curtain to provide privacy. Pull the patient's gown down to the waist. Females may need to remove their bra.	Assist the patient into a relaxed position.
Place the 10 electrodes on the patient's arms, legs, and chest as indicated in Figure 5–16. Choose flat, fleshy areas; avoid bony or muscular areas. If the skin is sweaty or oily, wiping with gauze pads will help electrodes stick better. Clip areas of thick hair with an electric razor to allow each electrode to adhere adequately. Attach the 10 leads to the correct electrodes.	Placement of the electrodes and attachment of the leads to the correct electrode are *critical* to obtaining an accurate ECG. Lead wires have letters indicating the location: e.g., RA means right arm, LL means left leg. Each of the six chest leads (V1–V6) has a specific anatomic location for correct placement. Do not use a razor blade to shave the hair because of the potential for minor skin lacerations. Place electrodes under the breast in women. Point leg leads superiorly.

Continued

Table 5–8 Performing an ECG—cont'd

ACTION STEPS	IMPORTANT NOTES

Placement of the Limb Sensors:



Anatomical location of leads V_1-V_6

V_1 = 4th intercostal space, right sternal border
V_2 = 4th intercostal space, left sternal border
V_3 = halfway between V_2 and V_4
V_4 = 5th intercostal space, midclavicular line
V_5 = 5th intercostal space, anterior axillary line
V_6 = 5th intercostal space, midaxillary line

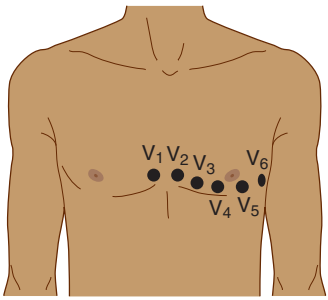


FIGURE 5-16: Twelve-lead ECG lead placement.

After attaching lead wires to the electrodes, assess the patient. If the patient is cold and shivering, gently place a blanket for warmth. Turn on the ECG machine, and enter the appropriate patient data. Ask the patient to relax, to breathe slowly, and not to talk. Press the AUTO button; the ECG machine will automatically read and produce the 12-lead ECG tracing. Review the tracing for quality.

Muscular contractions from shivering or trembling will interfere with producing a good ECG recording. Most ECG machines indicate appropriate lead connection but not necessarily correct location. Poor waveforms may be due to patient movement, deep breathing, or talking or to poor lead placement.

Table 5–8 Performing an ECG—cont'd

ACTION STEPS	IMPORTANT NOTES
If the tracing appears adequate, remove the electrodes from the patient, and replace the patient's gown. Document in the patient record the ECG procedure and the patient's response.	Many patients will ask the person doing the ECG, "Is everything OK"? Current protocols generally require interpretation by a cardiologist, other physician, or qualified advanced practice nurse. Inform patients that their provider or cardiologist will review, interpret, and discuss the results of the ECG with them.

FIGURE 5-17: Patient bedside monitor.

Box 5–1 Basic Bedside Monitoring

BLOOD PRESSURE

- Bedside patient monitors are usually capable of obtaining noninvasive blood pressures (NIBP). As with a manual BP, select an appropriate size cuff for accurate BP determination. Patient movement may affect readings.
- For continuous monitoring, set the monitor to record NIBPs at appropriate intervals (e.g., every 5, 10, 15, 60 minutes), subject to change depending on findings for a given patient. Too frequent inflation may be uncomfortable for the patient and may falsely elevate the BP.
- Set the monitor to alarm when the NIBP is outside the high or low limits for both the systolic and diastolic BP readings, according to the patient's past readings and condition.

Continued

Box 5–1 Basic Bedside Monitoring—cont'd

HR

- Bedside monitors record HR by measuring the pulse rate either from the pulse oximeter or from the cardiac rhythm leads.
- For HRs measured by pulse oximeter, inaccuracies may occur with poor circulation due to cold extremities or compromised vasculature or with poor waveforms on the monitor.
- For HRs obtained from the cardiac monitor, the leads pick up the electrical signals of the heart and convert those signals into a rhythm tracing. From the tracings, the monitor reads the number of individual beats per minute to display the HR. The display of the HR on a monitor changes frequently. Determine an average of these changing numbers when recording the HR.
- For either method, verify that (1) alarms are set and on for minimum and maximum HR according to the patient's condition (values may need adjustment with changes in patient status or care, such as addition of medications that affect HR) and (2) displayed values are accurate. Perform a manual pulse rate according to agency protocol or at least once per shift.

TEMPERATURE

- Some bedside monitors have a built-in temperature recording parameter. A dedicated wire from the monitor connects to a skin temperature recording device, a specialized urinary catheter, or a rectal probe.
- Continuous temperature monitoring may be important for monitoring neurologically unstable, hyperthermic, or hypothermic patients.
- Temperature probes require accurate placement to achieve reliable results.

RESPIRATORY RATE

When patients have cardiac rhythm leads in place, their respiratory rate displays according to changes in two leads during the rise and fall of the chest wall. Many patients do not have enough change in elevation of their chest wall during respirations for detection by the leads, so the displayed respiratory rate is often inaccurate. Respiratory rates obtained from bedside monitors require a "hands-on" backup method to confirm their accuracy.

OXYGEN SATURATION VIA PULSE OXIMETRY

- A pulse oximeter has a probe, typically placed on a finger, to read the percent of oxygenation in the blood. The infrared light in the probe evaluates the amount of blood that is saturated (typically with oxygen) and also records the pulse rate.

Box 5–1 Basic Bedside Monitoring—cont'd

- Pulse oximeter probes depend on correct placement in an appropriate location. For adults, the thumb or index finger is usually suitable. In young children, the top of the foot or big toe is often a good location. Special single-use tape-on probes facilitate continuous monitoring via pulse oximetry in pediatric patients.
- The display on the monitor includes an oxygen saturation percentage, pulse rate, and a visual waveform. The waveform gives an indication of the strength of the pulse and helps you evaluate the reliability of the displayed readings. If the waveform is not strong or the pulse rate is not accurate, you should be suspicious of the oxygen saturation reading.
- Like the HR display, the pulse oximetry display will change frequently over time. Set the alarm to sound when the oxygen saturation falls below a predetermined level.

CARDIAC RHYTHM

- Bedside monitors are often capable of displaying a single-lead ECG. Most monitors rely on three or five wires (leads) for placement at specific locations on the patient to record the electrical signals from the heart. The nurse or ECG technician attaches leads to self-adhesive monitor patches that adhere to a patient's chest. Depending on the location of the lead wires and the setting of the monitor, the display may be able to show more than one ECG view. In one common view, called lead II, the technician or nurse places leads on the upper right and upper left chest and on the lower left abdomen, hip, or thigh. This arrangement of leads produces the common cardiac tracing of an upright QRS (if the patient has a normal sinus rhythm).
- Lead wires typically follow a color-coded protocol, with the upper right wire white, the upper left wire black, and the lower abdomen wire either green or red. Some nurses learn the memory device "White is right and smoke over fire" to remember proper placement of the different lead wires. The lead wires on some monitors are replaceable, however, which can result in incorrect placement when replaced. A better method is to note the plug holding the lead wires, which always has RA (right arm), LA (left arm), and LL (left lower) on it so you can accurately place the leads in the correct location regardless of the color of the lead wire.
- In addition to setting alarms for minimum and maximum HR, many bedside monitors can sound an alarm when certain electrocardiogram tracings occur, such as ventricular tachycardia, ventricular fibrillation, or multiple ectopic beats.

Chapter Summary

This chapter focused on nine critical skills of patient care and provided essential details to help you master them. Being articulate about the action steps and associated elements will help you accelerate your own path to nursing competency, recognition, and promotion. In Chapter 6, we support the critical thinking and clinical judgment needed to deliver safe, outcome-driven patient care through an in-depth examination of shift planning.

CHAPTER 6

Shift Planning: Conquering Shift Organization and Prioritization

This chapter accelerates your mastery of "shifting." Although your shifts will not become automatic, a well-organized shift promotes optimal patient outcomes by means of planning and confident prioritization. A carefully crafted shift also acknowledges and accommodates the flexibility needed to respond to rapidly changing patient and unit conditions. To reach the destination of desired patient and organizational outcomes, we draw on all standards of the nursing process and several tested methods, such as comprehensive shift organizers and sample clinical scenarios.

Planning your shift is one of the most important things you can do to provide safe, quality patient care. This standard of the nursing process taps into multiple ways of thinking, described in Chapter 1, to help you cope with the reality that every shift and every patient assignment vary. As part of your shift planning and organization, we review how to give an organized end-of-shift report and how to make the beginning and end of your

COACH CONSULT

To achieve desired outcomes, we encourage you to go the extra mile: before each shift, think about, visualize, and feel the joy of making a difference in the lives of your patients. Your colleagues may not know your secret, but they will say you bring "something extra" to your nursing care.

shift a smooth hand-off for you and the others. Remember, we are all on one team, even when we work different shifts.

Equally important, being able to modify the plan appropriately is the hallmark of a professional in any field. Evaluation, another standard of the nursing process, derives from clinical reasoning and judgment about your nursing care plan and available data. Much like anticipating potholes on the road, anticipating and recognizing shift anomalies—and knowing how to rebound from them—can assist you in maintaining or adapting your plan of care. We include a table of common shift anomalies and discuss ways to keep your shift "out of the ditch" when one occurs.

Finally, as you develop your shift organization for the day, we show you how to prioritize patient care according to your overall patient assignment, individual patient needs, and other needs of the unit. Learning to prioritize at the bedside will also help you on tests and other demonstrations of your capabilities, including NCLEX-RN, annual skills sessions, and certifying examinations. We include examples of those challenging prioritization test questions and provide answers with rationales.

Pre-Shift Planning

As you may have noticed in clinical rotations, your shift actually begins before its scheduled time. This pre-shift time promotes a smooth transition, or hand-off, between shifts. Plan to be on your unit 20–30 minutes before your shift starts, according to your own comfort level and the approval of your nurse manager. Consider asking the unit secretary or a departing RN how things went, and set an immediate intention to achieve desired outcomes on your own shift. Begin by assisting your teammates with any pre-shift activities:

- Perform safeguards related to narcotics, such as locating keys and completing the count.
- Complete all resuscitation or crash-cart counts and any restocking assigned to Nursing.
- Answer phones or call lights.
- Restock intravenous (IV) fluids and supplies.

Contribute to a cohesive unit. Give the charge nurse time to evaluate patient acuity, consider staffing strengths and weaknesses, and complete assignments. The charge nurse will seek to start the shift on time and match patient acuity to the abilities of the staff scheduled for the shift. Manage your energy: come to work well-rested, well-fed, and with

a positive attitude. Experiment with simple approaches that foster excellent working relationships:

- Smile! This free gesture is contagious and instantly corrects the sluggishness occasionally seen even at the start of a shift.
- Compliment a teammate. Feeling good is also contagious and lightens everyone's load.
- Offer to be a shift buddy for a teammate with a heavier assignment. Reciprocation typically follows.
- Bring fresh fruit or vegetables for the break room once or twice a season. Some teammates will catch on and bring something to share in a different season.
- Share solicitations for continuing education offerings that intrigue you. Your teammates will see you as a leader in pursuit of excellence.

Shift Report

Attend to the shift report and hand-off of patient care on your unit. You have no doubt noticed variability among different facilities and even on different units within one facility. You may have heard a taped report or experienced a verbal report "on the run." Or you may have received a verbal report in the nurses' station, report room, or at the patient's bedside. During orientation, ask about, observe, and participate with your preceptor to acquaint yourself with how nurses give report on your unit.

Once you know that, decide what you need to know to organize your day and care for your patients. Adopt a shift organizer, which we refer to as "our brains" for the day. We include three sample shift organizers in Figures 6–1, 6–2, and 6–3 for you to try out or adapt to make your own. You may prefer a tool used by your preceptor, unit, or facility or even a blank sheet of paper. The key is to develop a system, unique to how you think about and plan patient care. Systematic use of the same form every shift will further assist you to develop a smooth, organized, and safe plan of care for every patient assignment.

During report, use your shift organizer and fill in the blanks. Obtain HIPAA-approved information, including **patient age, allergies, room number, admission diagnosis, admitting physician, and resuscitation status**. Then obtain the following planning and assessment data:

- Intake and output (I&O) for the last shift
- Vital signs (VS)
- Last time and dose of a narcotic analgesic
- Relevant past medical history (PMHx)

Room #	Room #
Age Sex Spirituality needs	Age Sex Spirituality needs
MD Phone	MD Phone
Dx	Dx
Allergies	Allergies
Diet: NPO CL Bland DB Card Soft Thk REG Supl TF	Diet: NPO CL Bland DB Card Soft Thk REG Supl TF
IVF Rate Site/Date	IVF Rate Site/Date
O's/Drains/Tubes:	O's/Drains/Tubes:
Activity: Bed Dangle Commode BRP Chair Amb x____	Activity: Bed Dangle Commode BRP Chair Amb x____
Bath: Self Bed Tub Shower Sitz Other	Bath: Self Bed Tub Shower Sitz Other
I&O: Time Amount	I&O: Time Amount
I&O: Time Amount	I&O: Time Amount
I&O: Time Amount	I&O: Time Amount
I&O: Time Amount	I&O: Time Amount
BM Flatus Bowel Sounds x____	BM Flatus Bowel Sounds x____
Neuro	Neuro
HEENT	HEENT
Card	Card
Circ	Circ
Integ	Integ
M/S	M/S
Resp	Resp
GI	GI
GU	GU
VS: T P R POx BP	VS: T P R POx BP
VS: T P R POx BP	VS: T P R POx BP
VS: T P R POx BP	VS: T P R POx BP
Lab results: Gluc Na^+ K^+ Ca^{++}	Lab results: Gluc Na^+ K^+ Ca^{++}
Other:	Other:
Tests:	Tests:
Other report:	Other report:
0800	0800
0900	0900
1000	1000
1100	1100
1200	1200
1300	1300
1400	1400
1500	1500
1600	1600
1700	1700
1800	1800
1900	1900

FIGURE 6-1: Sample shift organizer for four patients (front and back).

Room #	Age Service Dx/Chief c/o	Report	VS Call H.O. Wt	Bowel Bladder I&O	Safety Activity Diet	O_2 Resp. Care	Tubes Drains Wounds	IV access Fluids Rates	Pain PCA	Teaching DC Plan	Labs	Known Drug Allergies
			FSBG p.ox. q8 q4 T> SBP> < DBP> < HR> < RR> < Sats< UO<	______ ______ I&O	______ SCD ______ REG CL FL NPO	ISq1hWA		CL: PIV: IVF:				
			FSBG p.ox. q8 q4 T> SBP> < DBP> < HR> < RR> < Sats< UO<	______ ______ I&O	______ SCD ______ REG CL FL NPO	ISq1hWA		CL: PIV: IVF:				
			FSBG p.ox. q8 q4 T> SBP> < DBP> < HR> < RR> < Sats< UO<	______ ______ I&O	______ SCD ______ REG CL FL NPO	ISq1hWA		CL: PIV: IVF:				
			FSBG p.ox. q8 q4 T> SBP> < DBP> < HR> < RR> < Sats< UO<	______ ______ I&O	______ SCD ______ REG CL FL NPO	ISq1hWA		CL: PIV: IVF:				

FIGURE 6-2A: Sample shift organizer for four patients (front).

FIGURE 6-2B: Sample shift organizer for four patients (back).

RN: DATE:

Room	**0800**	0900	1000	1100	1200	1300	**I&O 1400**	1500	1600	1700	1800
							I&O				
							I&O				
							I&O				
							I&O				

10:00: check & record lab values, do acuity sheets, record 4 hr. PCA totals; **1400:** clear pumps, record I&Os, record 4 hr. PCA totals, update Care Plans & Goals, update charge nurse; **18:30:** all meds signed out?, replace MIVF bags so won't run out during shift change, record 4 hr. PCA totals, 12 hr. chart checks.

Room #:		Physician:		Dx:	
Allergies				Hx:	
WBC 4.1-11.0	Platelets 140-400	Mg 1.5-2.5		AST 2-50	pH 7.35-7.45
RBC 4.32-6.06	Sodium 135-145	Phosphorus 2.5-4.5		ALT 2-60	PCO_2 35-45
HGB 13.4-18.0	K+ 3.5-5.0	Chloride 98-110		BUN 7-25	PaO_2 80-100
Hct 40-54	Calcium 8.5-10.4	CO_2 22-26		Creat 0.5-1.4	HCO_3 23-26

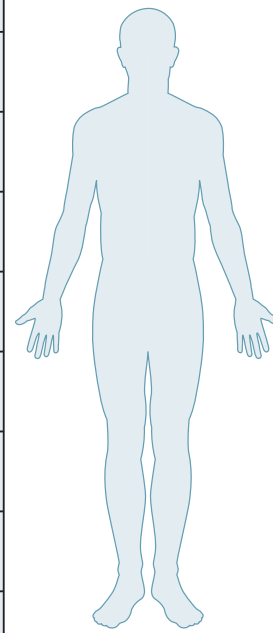
1900 IV: PO: Rect:	Neuro: A/O Sedated Other_____	
2000 IV: PO: Rect:	Head/Neck: Eyes: Ears: Mouth: Nose:	
2100 IV: PO: Rect:	Respiratory/Vent: RUL ___RML ___ RLL ____ LUL ____ LLL ____ Vent Settings: Wean: O_2:	
2200 IV: PO: Rect:	Tele/Cardiac: SR SB ST Afib IoAV BBB PVC PAC Paced	
2300 IV: PO: Rect:	GI: Bowel Sounds: Hypo Hyper WNL Absent NG: Nare: R L PEG:	
2400 IV: PO: Rect:	GU: Foley Rectal Tube Color: I/O _____ IN _____ OUT Last BM:	
0100 IV: PO: Rect:	Periphery: Arms: Pulses R/L WNL Absent Legs: Pulses D-R/L P-R/L WNL Absent Restraints: Flowtrons:	
0200 IV: PO: Rect:	Skin: D/I Moist Compromised Other: Edema: Anasarca:	
0300 IV: PO: Rect:	Vitals: TMax _____ SPO_2: _____ BP: _____ HR: _____ WT: _____	
0400 IV: PO: Rect:	Accu Checks: AC/HS Q6 BID	New Orders to Implement:
0500 IV: PO: Rect:	Diet: As tolerated NPO Cardiac Renal Diabetic Other_____ Tube Feed: Goal: Activity:	IV Access/Lines: TLSC: PIV: Gauge: CVP: Swan: Other:
0600 IV: PO: Rect:	AM Labs/Procedures CBC K Other: Chem 7 EKG Other: Mg C-XR Other: Phos Other:	Fluids Hanging/Med Drips: Maintenance: Sedation: Pressors: Other:
0700 IV: PO: Rect:	Test Results	Dressing Changes:

FIGURE 6-3: ICU shift organizer.

- Current head-to-toe assessment
- Drains and dressings
- Relevant diagnostics, including procedures scheduled on or off the unit
- Recent change in condition
- IV site(s)
- IV fluid(s), rate, and amount hanging (credit)
- Ambulatory status
- Diet ordered
- Family dynamics
- Psychosocial needs

By the end of report, your goal is to "hit the ground running." A disorganized or insufficient report could require more time than is available to catch up on a patient's needs.

COACH CONSULT

Just as starting IVs and dropping nasogastric (NG) tubes are skills to learn, so are listening to and giving reports. Whether giving or receiving report, think about what a novice nurse or float nurse would want to know about your patients. *Ask for too much* information at first. Over time you will learn to ask for less as you become aware of alternative resources for information. *Give too much* information at first. You will learn quickly to give less based on the receiving RN's cues.

Conquering Shift Organization

To organize your shift, we recommend the IPAD mnemonic, detailed below and condensed in the margin note:

- *I*dentify: Begin with the end in mind. Identify shift goals and desired patient outcomes via available data. Apply what you learn during report from charts, medication administration records (MARs), and care plans. Use your shift organizer to promote a consistent approach to patient-centered care.
- *P*rioritize: Put your critical thinking skills to work. Review the section on prioritization, presented later in this chapter, to explore how use of the standards of the nursing process will increase your abilities and confidence to prioritize and reprioritize throughout any shift.
- *A*nticipate: Go beyond critical thinking to predictive thinking. Review available data for as-needed medications, ambulation orders, and diagnostic procedures. Ask the charge nurse for an update on expected discharges and admissions. Make a mental note of empty beds or divert status for unexpected admissions.

- *D*elegate: Add creative thinking to keep pace and manage your workload. Even if your unit does not employ assistive personnel, consider available resources at the beginning of each shift. If your team lacks patient care assistants, LPNs, and/or certified nursing assistants, consider negotiating with a charge nurse, team lead, or other RNs for mutually agreed upon delegation.

ORGANIZING MY SHIFT

Use the IPAD mnemonic:
*I*dentify
*P*rioritize
*A*nticipate
*D*elegate

The IPAD method transforms the assessments and interventions required by your individual patients into a roadmap for implementation and evaluation of your entire patient assignment, including admissions, transfers, discharges, and trips off your unit for diagnostics and treatments. Decide during report the overall organization of patient care throughout your shift for both individual patients and your total group of assigned patients. Along with the information received in report, add the following activities to your planning:

- Preparation for discharge, which begins at admission
- Possible times for patient and family teaching
- Time to chart
- Time for a meal and breaks

Also include the tasks you plan to delegate and to whom. Remind yourself with a notation on your shift organizer to follow up on what you delegate. This comprehensive approach will allow you to regain some organization when you have a shift or patient anomaly. In addition, you will increase your chances of successful delegation if you make yourself available to teammates when your workload permits you to offer help. At the very least, negotiate with a fellow RN to be shift buddies. When you work with someone on a regular basis, you can communicate with thumbs up or down when your buddy walks by. Then respect the index finger up, meaning "hold on a minute." Be ready to delegate a specific activity.

PEAK PERFORMANCE: DELEGATION

Delegation is the process of transferring a selected nursing task to another individual who is competent to perform that specific task. Of critical importance, RNs may NOT delegate assessments to unlicensed assistive personnel. For example, when you ask certified nurses' assistants (CNAs) to bathe patients, you may not delegate the patients' skin assessment to them.

What is a shift or patient anomaly? We all have experienced them but may not have known this term. An anomaly is an irregularity, or something that deviates from the norm. Many anomalies occur in patient care. Box 6–1 lists commonly occurring patient anomalies.

Sometimes more than one anomaly will occur within one shift. Although no one can anticipate every anomaly, maintain a high degree of suspicion. Consider the mechanism of injury or extent of deviation from normal limits. Anomalies are common in the following scenarios:

- A patient transferring from the operating room (OR) with a core temperature lower than 96° F may experience cardiac dysrhythmias.
- A patient who sustained a high-speed or head-on motor vehicle collision or who was unrestrained during a crash may have a bruised heart and/or lungs and experience mild to severe sequelae, including cardiac dysrhythmias or dyspnea.
- A unit that is in disarray, whether due to carelessness or the aftermath of a dying patient or resuscitation patient, may provoke complaints from patients' families.

Ask for help when an anomaly occurs. Your charge nurse, preceptor, or supervisor may help solve the problem or delegate care. You can recover from a disruption to your overall shift organization through these steps:

- Identify the anomaly quickly.
- Prioritize the anomaly within your patient assignment plan of care.
- Anticipate any further anomalies.
- Use the IPAD method and assistance from others to help you recover from an anomaly.

Box 6–1 Commonly Occurring Patient Anomalies

- Patient falls
- Change in condition (your patient or another patient on the unit)
- Patient complaint/family complaint
- Patient discharged (beginning or end of shift or not expected)
- Patient admission (beginning or end of shift or not expected)
- Patient transfer to another unit (beginning or end of shift or not expected)
- Patient leaving against medical advice (AMA)
- Patient preparation for unexpected procedure
- Patient dies (your patient or another patient on the unit)
- Concern expressed by a colleague as to correct patient care
- Bedside procedure at beginning or end of shift

PEAK PERFORMANCE: PRIORITY SETTING

Tune up your "priority-setting engine" by working through the clinical reasoning and judgment needed for the following patient assignments:
Room 101: Ms. Murphy Sign, 42 y.o. female S/P laparoscopic cholecystectomy (1 day ago) to be discharged today
Room 102: Mr. Sam Adams, 30 y.o. male with acute pancreatitis (alcohol abuse)
Room 103: Mr. Jonathon Wintergreen, 87 y.o. male with confusion and suspected urosepsis
Room 104: Ms. Jennifer Staples, 23 y.o. morbidly obese female S/P gastric bypass
Room 105: Ms. Sugar Maple, 57 y.o. female with poorly controlled type 2 diabetes mellitus

What would happen to your shift organization and prioritization if any of the following anomalies should occur?
Ms. Sign is ready to leave at the beginning of your shift.
Mr. Wintergreen pulls out his urinary catheter, climbs over the side rails, and falls.
Ms. Sign develops a fever and chills *and* Mr. Wintergreen falls *and* Mr. Adams shows signs and symptoms (S/S) of peritonitis *and* Ms. Staples arrives on the unit with her PACU nurse eager to give you a postoperative report *and* Ms. Maple decides to leave AMA.

How would you recover from these shift anomalies? See approaches and rationales in Box 6–2.

Box 6–2 Handling Anomalies

There are many ways to prioritize individual patient care and the overall patient assignment. You may change your order or rank with additional information. This exercise is to get you to think critically about and identify, prioritize, anticipate, and delegate your way through patient or shift anomalies.

1. *Ms. Sign is ready to leave at the beginning of your shift:*

Even a patient about to be discharged can put you off track. You may be able to handle this anomaly if report goes smoothly and you obtain all the information you need. If you are a nursing student or a new graduate on orientation, you and your preceptor could "divide and conquer." You also could ask for help from the nurse on the previous shift caring for the patient, your charge nurse, any unlicensed assistive personnel, or even your other patients. After a brief assessment of each patient, you could say, "I will discharge a patient and come back with your 8 o'clock medications. If I am not back when your breakfast arrives, please put on your call light." Your patients likely will remain *patient* and even help keep you on track by signaling you their breakfast has arrived. Ask for help, and then remember to reciprocate when you catch up.

Continued

Box 6–2 Handling Anomalies—cont'd

2. *Mr. Wintergreen pulls out his urinary catheter, climbs over the side rails, and falls.*

Your first concern is your patient. Take the time to assess him fully. Look for any possible head injury, and ask the patient's physician to order a computed tomography (CT) of the head if you even suspect the patient hit his head. Think of the sequelae that could occur if the patient takes the blood-thinning drug Coumadin. Examine his body for bruising, especially near the hips and wrists. After completing your assessment, ask for help to transfer him back to bed, and then notify the physician, charge nurse, and nurse manager or supervisor. Notify family members as well. Complete any additional interventions as ordered (e.g., frequent VS, imaging or x-rays, and reinsertion of new urinary catheter).

3. *Ms. Sign develops a fever and chills and Mr. Wintergreen falls and Mr. Adams shows signs and symptoms (S/S) of peritonitis and Ms. Staples arrives on the unit with her PACU nurse eager to give you a postoperative report and Ms. Maple decides to leave AMA.*

This chaotic scenario could happen. How would you handle it? You will need to ask for help! Unlicensed assistive personnel might be able to get new VS on Ms. Sign and transport her to radiology. Mr. Adams's physician is on the unit and planning to transfer him immediately to the intensive care unit (ICU). You will need to assess Mr. Adams, gather documentation, and ask another team member to pack up his belongings and go to the ICU. Give report to the ICU, and return to the unit. You find Mr. Wintergreen on the floor, and Ms. Staples's nurse needs to give you report. Ask another nurse, your preceptor or charge nurse, to take report. Assess Mr. Wintergreen, call his physician with your assessment and new set of VS, and send him for a CT of the head. Now your teammate tells you Ms. Maple wants to leave *now*. You wanted to check in on your new patient (Ms. Staples), but you see that the charge nurse is still with her. You go to see Ms. Maple and talk with her about her reasons to leave. She wants to leave because the physician will not let her receive a visit from her dog. Whether or not this is a priority to you, this is a priority to Ms. Maple. Her physician arrives, and you assure him the dog can visit if it is up-to-date on all vaccines and stays only a short time. Ms. Maple agrees to stay. You now go to Ms. Staples's room and get report on your new patient. She is stable and you leave to prepare 0800 medications.

End of Shift

Now we have come to the end of your shift when you will transfer care to another member of your team. It is just as important to end your shift in an organized manner. This consciously competent approach will help your teammates start their shift in an organized manner. Consider the transition in this way: your end of shift is their pre-shift.

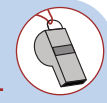
In preparing to give report and end your shift, collect the data needed for the most up-to-date assessment of your patients for your teammates:

- Visit your patients one last time.
- Review and update your shift organizer, patient assessments, care plans, and medication administration records (MARs).
- Give verbal or taped report according to the unit or facility's protocol. Include the same kinds of information you received. (Review the important elements from the list presented above in the section on Pre-Shift Planning and Report.)
- Assist with change-of-shift duties.
- Complete your charting.

To accelerate your progress in shift planning, use reflective thinking to review that day's shift report and patient hand-off as you return home:

- Did you learn later that the preceding RN omitted important information, such as a diagnostic test scheduled for your shift? Next time, use your shift organizer as a checklist during report and ask questions. Hold accountable those RNs who rush or seem careless.
- Did you get a negative reaction because you gave too much detail? Next time, pointedly say that you are giving the detail you would like to receive, and then ask what the receiving RN would like to know.
- Were you frustrated when the preceding RN wondered why you wanted to know a patient's age? Next time, patiently say you were considering adding some developmental goals to the care plan.

COACH CONSULT



Review the IPAD mnemonic from time to time to tune up your shifting!

Prioritization

Prioritization puts a value on each assessment, intervention, or other activity and places them in rank order. This rank may relate to time or position with another activity. If something is a priority, it is a need or problem that requires immediate action. Translate "priority" with such words as "first,

initial, immediate, most important, best, or safest." These words mean priority in both NCLEX-RN test questions and in actions at the bedside. Prioritize care of your patients using critical thinking and tools acquired in clinical rotations:

- Put your patients at the center of care. You, with others on the interdisciplinary health-care team, must mutually rank needs while considering patients' needs first.
- Review Box 6–3, which lists prioritization strategies to keep the patient first and to address life-threatening versus non–life-threatening assessments.
- Prioritize other aspects of patient care according to integral theories of growth and development and implementation of care (e.g., Kübler-Ross Theory of Death and Dying, Erikson's development theory, and teaching-learning theory).

The classic Kübler-Ross Theory of Death and Dying has mainstream acceptance, but its presentation suggests a simplistic linear progression that does not match reality. In 1995, Solari-Twadell and colleagues published the Pinwheel Model of Bereavement, which recognizes loss as a unique lived experience. Their pinwheel-shaped model—derived from research, theory, and clinical experience—captures the ebb and flow of grief and keeps the focus on the story of the deceased. Grieving family members resonate with this model and appreciate the way it honors their loved one through six core themes: being stopped, hurting, missing, holding, seeking, and valuing. Three larger themes of bereavement are change, expectations, and inexpressibility. The authors also identify nurses' capacities for "being with" the bereaved.

Box 6–3 Prioritization Strategies

- Patient-centered (physical, psychological, safety, patient expectations)
- Life-threatening versus non–life-threatening
- *A*irway, *B*reathing, *C*irculation (ABCs)
- Maslow's Hierarchy of Needs (physiological: survival, safety, and security; psychological: love and belonging; self-esteem; self-actualization)
- Growth and development theories (Erikson, Piaget, Freud, Skinner)
- The nursing process: assessment, diagnosis, outcomes identification, planning, implementation/intervention, evaluation (remember ADOPIE)
- Kübler-Ross's Theory of Death and Dying: denial, anger, bargaining, depression, acceptance
- Teaching-learning theory

Look and act at the level of the patient by reviewing patient cases in the form of test questions that might appear on the NCLEX-RN or a certifying examination. Challenge yourself to think through this common clinical situation:

- What should the nurse do to meet the *patient's basic physical needs?*
  1. Pull the curtain.
  2. Answer the call bell immediately.
  3. Administer physical hygiene.
  4. Check VS.

Of course, all of these actions are important. To select the correct answer, think carefully about what the question asks. In this case, the question asks about the patient. The correct answer is option 3, which gives priority to administering physical hygiene, a *basic physical need* of the patient. Notice that the word "physical" is in both the stem of the question (what is being asked) and the correct answer. Many test writers, however, construct questions and answers to avoid such "giveaway" clues. Look for the principle being tested and use a process of elimination.

Pulling the curtain and answering the call light immediately are important activities of staff on the unit, but they are not *basic care needs* of the patient. The word "immediately" creates a sense of urgency but does not alter the activity to a patient's basic physical need. Checking VS is important *to the nurse* and is one task completed during care of the patient. *Think patient first! What would he or she want?*

Now, examine a serious clinical situation:

- Your patient is asking you for a laxative as she has not had a bowel movement (BM) in 13 days. Her physician admitted her this morning with abdominal pain, vomiting, and dehydration. Her NG tube is putting out moderate amounts of brownish fecal material. She will have surgery at 4 p.m. today. What would you do to provide the *best* care?
  1. Give her a laxative.
  2. Get an order for a laxative.
  3. Help the patient take her own laxative.
  4. Explain to the patient it is risky to give her a laxative at this time until the cause of her abdominal pain is determined.

As you may have surmised, this patient likely has a bowel obstruction. If the RN gives a laxative and stimulates peristalsis, a perforation of the bowel could result. The correct answer, therefore, is option 4. In fact, the RN must *not* give a laxative. Instead, the RN should assess the patient's

readiness for preoperative education, to include why the patient cannot receive a laxative; how to turn, cough, and deep breathe; and how to splint over the abdominal incision after her scheduled surgery.

Review the following scenario to prioritize nursing actions using the ABCs:

- Mr. Smith comes to the emergency department (ED) with an asthma attack. While trying to get to the ED, he trips and cuts his knee on some glass. What would you do *immediately?*
  1. Clean his knee, and prepare for suturing.
  2. Move his car for him as he parked in a no-parking zone.
  3. Administer oxygen and nebulizer medications.
  4. Measure his height and weight.

You likely know the correct answer is option 3. This patient needs his airway and breathing stabilized first before the cut in his knee receives care. What if you wondered further about ranking these activities? You would administer oxygen and an albuterol nebulizer to open his airways and supply his brain and body with oxygen. Once his oxygenation improves, then you would obtain VS, including weight in anticipation of accurate dosing of any additional medications. Next you would clean his knee and assess for the likelihood of needing a suture tray. Finally, you would notify security about his car.

Maslow's Hierarchy of Needs—a model that demonstrates the biological, emotional, and psychosocial aspects of human needs and functioning—helps the RN establish priority actions related to human needs. A patient must attain one level of needs (physiological) before achieving the next higher level (safety and security):

- Physiological needs (necessary for survival, including pain management): first level
- Safety and security: second level
- Love and belonging: third level
- Self-esteem: fourth level
- Self-actualization: fifth level
- Aesthetic (larger meaning of life): sixth level (sometimes included in the model)

Consider the following question:

- What should the nurse do to help meet a patient's *self-esteem needs?*
  1. Encourage the patient to perform self-care when able.
  2. Suggest the family visit the patient more often to complete all his care for him.

3. Anticipate all needs before the patient requests help.
4. Assist the patient with bathing and grooming only.

Option 1 is correct, as the RN must encourage patients to meet their own needs to promote their self-esteem. The family may help but not complete all care. Options 2, 3, and 4 include the words "all" and "only." Those words are clues that the answer, especially on an NCLEX-RN question, is not correct. Words that mean "no exception" include "always," "never," "all," "every," "none," "must," and "only." Try not to use them on the unit, which will assist in your critical thinking at the bedside. Rarely is a situation "all or nothing."

Try two more questions using Maslow's hierarchy to prioritize among options:

- When administering oral medication to children, the *most important* factor to consider is their:
  1. Age.
  2. Weight.
  3. Level of activity.
  4. Developmental stage.
- A patient adaptation that may *initially* indicate internal abdominal bleeding postoperatively would be:
  1. Pain in the area of bleeding and an increased urinary output.
  2. Cool, clammy skin and a decreased heart rate.
  3. Restlessness and an increased heart rate.
  4. Hunger and a decreased urinary output.

For the first question, you would calculate the amount of any children's medication using a child's weight in kilograms (option 2). In adults, you would sometimes use weight but more often look at liver and kidney function to determine a safe dose of a medication. The second question requires you to know the differences between early and late signs of hypovolemic shock. If blood flow is reduced, the patient becomes restless and, as BP drops, the heart rate compensates and begins to rise (option 3). Late signs of shock involve a decrease in urinary output and eventually in cardiac output.

An example of caring for patients using developmental theories follows:

- In Erikson's Theory of Psychosocial Development of the Life Cycle, which stage does the infant proceed through *first?*
  1. Identity versus Role Confusion
  2. Industry versus Inferiority
  3. Initiative versus Guilt
  4. Trust versus Mistrust

The correct answer is option 4. This question requires you to recall the stages of development defined by Erikson. These stages are helpful to you at the bedside as you determine reasons for assessed or anticipated patient behaviors.

The standards of the nursing process also facilitate prioritization. Look at the following question:

- While on rounds, you find a patient on the floor in the hall. What should be your *immediate* response?
  1. Inspect the patient for injury.
  2. Transfer the patient back to bed so no one sees he or she fell.
  3. Move the patient to the closest chair.
  4. Report the incident to the nurse manager.

The first standard of the nursing process is assessment, so you would *assess* the patient first before moving him or her. Words related to assessment include "inspect," "auscultate," "percuss," and "palpate." Once you assess the patient, you can get help to return the patient to bed safely and then notify the physician, charge nurse, and/or nurse manager. You will also notify the family. Other staff on the unit can help watch the patient while you document the occurrence.

To determine a nursing diagnosis, whether at the bedside or for a test question, assess the patient first. Your assessment findings will guide you in deciding on the diagnosis. The following question is an example of using the nursing process to arrive at a priority nursing diagnosis:

- Your patient is 3 days postoperative. He reports pain of 2–3/10. His VS are stable, and he is not requiring oxygen. He is taking clear and soft foods. He has not had a stool since surgery. The *most important* nursing diagnosis related to the information is:
  1. Pain
  2. Ineffective airway clearance
  3. Sleep Disturbance
  4. Constipation

Typically, constipation (correct answer is option 4) will not be a priority nursing diagnosis, but if your assessment shows stability among other priority-setting strategies (such as ABCs), then there is no better answer. The patient needs to increase fluids, increase ambulation, and receive a stool softener or laxative. This nursing diagnosis would be of priority on the patient's nursing care plan.

Another typical question or bedside assessment deals with the evaluation of the patient after receiving various treatments:

- You are evaluating Mr. Jones after administering medications for pain, bronchoconstriction, and low blood pressure. You are also

looking for his lost wallet. Which of the following *outcomes* is *most important?*

1. No c/o SOB, RR 18, regular
2. Found wallet in pants pocket
3. BP 120/70, HR 68, no syncope
4. Pain 2/10

Using prioritization strategies, the ABCs apply, and option 1 is the correct answer. Certainly, all actions are important, but when prioritizing a question or at the bedside, be most concerned about reducing bronchoconstriction to optimize oxygenation.

Consider this final question that is relevant to your daily clinical patient teaching. This question deals with teaching/learning theories and the importance of evaluating your patient's readiness to learn and his or her cognitive level:

- Which is *most important* when predicting the success of a teaching program regarding learning a skill?
  1. Only the learner's cognitive ability
  2. The amount of reinforcement after the program
  3. Only the extent of family support
  4. The interest of the learner

The correct answer (option 4) should stand out clearly from the rest of the possible answers. Note the word "only" in two of the answers. Again, words that signal "no exception" are a clue to an incorrect response. Obviously, the amount of program reinforcement is not as important as the patient's readiness to learn. You will have nothing to reinforce if the patient is not ready to learn.

Chapter Summary

Conquering shift organization, giving and receiving report, and learning how to prioritize care are skills you will develop in your clinical practice. Remember to include the pre-shift time in your day, and be consistent in your setup of the day and delivery of report. Prioritize individual patients and your overall patient assignment using tools such as IPAD, patient-centered care, ABCs, and pertinent biological and psychosocial theories of care. Use the IPAD method to identify an anomaly quickly, prioritize immediate care, anticipate other anomalies that may follow, and delegate while asking for help. Critically reflect on those "good" and "bad" shifts, "good" or "bad" reports, and "good" or "bad" hand-offs so that you may learn from them. Grab your keys—you are ready to go!

CHAPTER 7

Communication: Mastering Collaboration, Delegation, and Documentation

The profession of nursing utilizes the nursing process to:

- Diagnose and treat human response to actual or potential health problems.
- Provide anticipatory guidance related to health, illness, and developmental stages across the life span.
- Promote health.
- Prevent disease.

Many nurses begin their careers in acute care settings at the bedside, where the first two professional aspects listed above are paramount. The latter two aspects have more prominence in community health settings. Nurses in advanced practice address all four aspects in the course of a patient encounter.

In any health-care setting, the ability to communicate a patient's response and maintain an effective nursing plan of care requires timely, efficient, and clear communication. This communication occurs between the nurse and other nurses, the patient, the patient's family, and others on the interprofessional health-care team. Additionally, communication

typically requires both written and verbal components and assessment through evaluation of the patient's response to care.

This chapter features essential content related to communication:

- The importance of impeccable communication in the health-care setting
- The guidance needed for exemplary interprofessional collaboration via appreciation of work styles
- The professional and cutting-edge communication technique of I-SBAR-R
- The principles of delegation along with its relationship to accurate and timely communication
- The skill of documentation

Communication

To communicate in any health-care setting, you must be able to gather and share competent information with patients, family members, physicians, other nurses, and the rest of the interprofessional team. This process involves sending and receiving messages that are verbal, nonverbal, and a combination of both. Often, the combination of communication methods clarifies the communication process more thoroughly than either method alone. Nurses use processes of communication to:

- Conduct a focused history and physical examination
- Provide patient and family education
- Give and receive report
- Facilitate and delegate care among the interprofessional health-care team
- Address changing patient conditions

Effective communication is on the list of imperatives for every nursing curriculum, professional nursing organization, and health-care accrediting

EVIDENCE FOR PRACTICE

The Joint Commission has issued the following National Patient Safety Goals related to communication:
2009 Hospital NPSG 02.01.01: Readback of telephone orders
2009 Hospital NPSG 02.02.01: Standardized accepted abbreviations
2009 Hospital NPSG 02.03.01: Timeliness of reporting
2009 Hospital NPSG 02.05.01: Standardized "hand-off" communications

body. In fact, the second goal of the Joint Commission's National Patient Safety Goals (NPSG) is to improve the effectiveness of communication among caregivers. Developing the knowledge, skills, and attitudes to promote effective communication is essential to your practice and to safe patient-centered care. The initiative known as Quality and Safety Education for Nurses makes the role of communication explicit among its competencies, especially related to teamwork, collaboration, and informatics.

To ensure the person with whom you communicate receives the same message you intend to send, study the process of nonverbal communication. Many factors influence the recipient's interpretation of your communication. Nurses include carefully selected, culturally sensitive nonverbal messages, which may result in a more accurate interpretation of a communication than a verbal message alone. Nonverbal messages include:

- Vocal cues, such as inflection, tone, intensity, or speed
- Action cues, such as smiles, hand gestures, movement, and other forms of body language
- Object cues, such as some physical piece of a routine that represents that routine, such as a bath basin for personal hygiene or a medicine cup for scheduled medication
- Personal space cues, such as proximity when focus is needed or distance farther than 3 feet from a patient when you must leave a stable patient's room to attend to a more critical patient
- Touch cues, such as an attention-getting hand to the shoulder or a comforting hand to the forearm

If your vocal cues do not match your words, the recipient may not respond to *what* is said but *how* something is said. This mismatch can result in misinterpreting your meaning. For example, if your speech is calm, slow, reassuring, and without inflections that reflect disapproval, your patient will perceive the desired intent and be reassured. If, however, your speech is rapid, loud, quivering, stammering, or condescending while you try to reassure a patient, your patient will recognize your uncertainty or judgmental position.

Although some professionals believe they may reach a particular audience through "street talk," in our experience this kind of short-term connection ultimately harms the rightful expectation of a professional encounter. To convey medical information to a layperson, you may need to explain terms in more common, everyday language or through the use of analogies or metaphors. For example, some patients or their family members would not know that the term "myocardial infarction" means heart attack. However, medical jargon is essential to communicating with

PEAK PERFORMANCE: ASSESSING CUES

The following case example demonstrates what can happen if the message sent is not the message received.

Ms. Stoic, a 70-year-old Asian-American female, was admitted to your medical-surgical unit for complaints of "a little stomach ache." She explains she has experienced pain in her abdomen for the past 3 days. She states her daughter insisted on bringing her to the emergency department. As you document her admission history and physical, you notice Ms. Stoic winces when changing position, holds her abdomen while leaning forward in the chair, is pale and diaphoretic, and has dry mucous membranes. Additionally, she reports vomiting several times today and having her last bowel movement 1 week ago. She describes her abdominal pain as a little achy and rates it as 3 out of 10. She states she does not want to bother anyone and should just go home.

Do the verbal and nonverbal cues for pain match?

Is this patient likely sicker than she describes?

It is apparent the verbal and nonverbal cues observed with this patient do not match. Ms. Stoic states her pain is merely achy (scored 3 out of 10), but the observed physical assessment suggests to you she is in considerably greater pain (winces when changing position, holds her abdomen while leaning forward in the chair, and is pale and diaphoretic).

Ms. Stoic likely is quite ill, as she exhibits the observed findings and reports vomiting several times today with her last bowel movement 1 week ago. A patient her age and with her various signs and symptoms may in fact be experiencing a small bowel obstruction, which can be a life-threatening pathophysiological problem.

other members of the health-care team. Interprofessional jargon provides clarity and brevity among those communicating and produces an efficient form of report.

Understanding that people of different ages, cultures, backgrounds, and personality types receive and interpret the same communication differently is essential to effective communication. For example, if you tell a patient and family members that the patient's urinary output is less than 15 mL per hour, they may not receive this information the same way as a physician, advanced practice nurse, or staff nurse on the unit. Similarly, if a patient declines admission to the hospital for life-saving treatment because no one is at home to feed the cat, you must receive this communication with the intended sincerity and urgency of the message.

Different cultural communication patterns also need consideration. For example, the volume of speech of a European American, African American,

or Arab American may be louder naturally, and a Chinese American may misinterpret this volume as a sign of anger. Therefore, nurses must listen with twice the intensity as they speak. Business leader Stephen Covey puts the maxim this way: we must seek first to understand those we are communicating with before we can be understood.

One cut-to-the-chase method for effective communication comes via our Coach Quadrants, depicted in Figure 7-1.

- The upper right quadrant represents the ideal: AO stands for "appropriate observation," which you deliver with an "I" message. Appropriate observations begin with phrases such as "I noticed," "I am curious," and "I wonder." Whatever follows comes from your own perspective, leaving you accountable for the words that complete the sentence.
- The upper left quadrant is valuable when needed: AC stands for "appropriate critique," which you deliver with an "I" message in private. An appropriate critique registers a complaint without judgment or personal criticism, and the person issuing the complaint is in a position of authority to do so. The context for authority varies in health-care settings, but the ideal is a collaborative environment in which every voice brings value to safe, competent, and principle-centered patient care. We must also empower patients with the authority to issue a complaint related to their subjective experience.
- The lower left quadrant is not therapeutic. IO stands for "inappropriate observation," which reflects a communication style that puts patients on the defensive. This style is recognizable because it begins with "you," as in "You have not gotten out of bed today." Even more problematically, "you" messages often result from exasperation and carry the additional mistake of exaggeration ("you always" or "you never"), as in "You always put on your call light within 5 minutes after I leave your room."

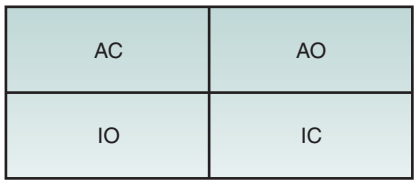


FIGURE 7-1: Window on communication styles.

- The lower right quadrant represents unprofessional behavior. IC stands for "inappropriate critique," which often manifests as public criticism. Turn on your systems thinking and gauge the climate on your unit: is public criticism at the nursing station a common occurrence? You can make a difference in the professional tone on your unit when you make a suggestion about an unprofessional interaction, such as "Please take this conversation into the conference room."

To confront a patient's problematic or puzzling behavior, consider using ICE questions. The ICE mnemonic refers to progressive statements that address behavior typically labeled as "noncompliant." We prefer to regard this kind of behavior as nonadherent and seek a patient's underlying belief. ICE stands for:

- I = **Interest:** Statements of interest help when nonadherent behavior first surfaces: "I am interested in you and your life. Tell me about the challenges you're facing because of your diagnosis."
- C = **Curiosity:** Statements of curiosity may reveal a persistent obstacle: "I am curious about your routine for taking your medications."
- E = **Explanation:** Statements seeking explanation may offer insight into unhealthy behavior: "I wonder if you can explain your request for food choices that are not on the prescribed menu." Notice the insertion of "I wonder," which softens the use of "you." You can further soften the statement by using "describe" instead of explain. This approach offers an appropriate way to explore a patient's accountability without damaging the relationship.

Whether you are completing a focused or comprehensive assessment, you will use the techniques of a patient interview, including cues from patient observation, and findings from your physical assessment to gather and interpret information. This information, together with the nursing process and your increasing clinical judgment, facilitates your development of mutually agreed-upon goals and an appropriate nursing plan of care.

COACH CONSULT

Nurses must maintain a therapeutic relationship with their patients. A powerful rationale comes from business leader Stephen Covey, who refers to inflicted relationship damage as making a withdrawal from the recipient's emotional bank account. Patients often have so little reserve that nurses will have no opportunity for patient education if they inflict this sort of damage under the guise of paternalistic "patient compliance."

The patient interview is a structured communication with the purpose of obtaining subjective data from the patient. The patient interview requires the use of interpersonal communication skills in which you maintain a neutral, nonjudgmental position. A competent approach to interviewing features three systematic parts:

- **Introduction phase.** Many nurses walk in and "get busy," forgetting to introduce themselves to the patient. This gaffe hinders the establishment of rapport. Introduce yourself, and give your patient the opportunity to ask any immediate questions. Preoccupied patients will have difficulty focusing on *your* questions.
- **Working or data collection phase.** Subjective data derive from the patient's health history and the patient's current experience. Patients' thoughts, beliefs, feelings, sensations, and perceptions of a problem are their current symptoms. Subjective data include anything the patient says. Symptoms are not objectively measurable and may come from the patient (primary source), a family member (secondary source), or, if necessary, previous medical records (secondary source). You may ask both open and closed questions as you gather subjective information.
- **Termination phase.** This phase features three parts. First, you will give an overview of the next several hours to days, according to what you already know about the patient's situation. Second, you and the patient will set some mutual goals. Third, you will begin planning for discharge. Most units have a formalized approach with preprinted forms to complete and route to ancillary services such as a social worker or home health agency.

This consistent approach paves the way for a smoothly conducted patient interview, promotes development of an interpersonal connection, and facilitates pattern recognition on behalf of patients' safety and well-being. Unfortunately, patterns also include an array of pitfalls (Box 7–1). When you recognize yourself in the midst of a pitfall, correct the error, and restate your question: "I just asked you two questions at once. Let me ask them one at a time."

During the interview and the physical assessment you collect data as you observe your patient. Initial observations provide clues to both overt and covert problems and assist in prioritizing your physical examination. Engage your critical thinking further by using senses that increase your efficiency. For example, when you take a blood pressure, feel the patient's skin for temperature and turgor, smell his or her general body odor (fruity breath raises suspicion for high blood glucose or diabetic ketoacidosis), listen for any

Box 7–1 Potential Pitfalls of the Patient Interview Process

- Leading the patient: "You look better today. You must be feeling better."
- Limited objectivity due to bias: "My own father was an alcoholic, too."
- Letting family members answer for the patient: "The mother always says the patient has a headache."
- Asking more than one question at a time: "Have you had a bowel movement and walked around the unit today?"
- Not giving time for the patient to respond to the question: "What do you understand about your surgery today? Let me just give you this brochure."
- Using medical jargon: "Since you had an MI, your CABG times 4 is set for tomorrow."
- Assuming or jumping to conclusions: "Great job! You ate all of your lunch" (when, in fact, the patient's son ate it).
- Taking a patient's comments personally: "I don't want to stay in the hospital. I want to die." (You did not cause the patient's wish.)
- Offering false reassurance: "You've got the best surgeon in the country."
- Giving advice: "The best way I found to stop smoking is with a nicotine patch."

COACH CONSULT

What communication techniques facilitate a successful patient interview?
Acknowledge a patient's response.
Use silence effectively.
Clarify if you are unsure of a response.
Restate the patient's main ideas.
Be an active listener.
Use reflection, redirection, focusing, and sequencing to prevent misinterpretation.
Use judicious humor to reduce anxiety.
Summarize what you heard, and give your patient an opportunity to correct your summary.

audible breathing (wheezes could signal respiratory tract obstruction), and see overt grimacing. Other sense-dependent questions might include:

- While observing your patients, do they appear ill or in distress?
- What are they doing while you observe them? Are their nonverbal cues consistent with their verbal communication?
- Have you observed any unusual movements? For example, clonus in a pregnant woman suggests pre-eclampsia.

Once you have developed a personal connection with your patient, completed the patient interview, and noted your observations, perform the physical examination. To promote the relationship needed for mutual goal setting, communicate what you do, why you do it, and what you find. An engaged patient will facilitate your ability to hone in on normal and abnormal findings. In general, you will inspect, palpate, percuss, and auscultate (IPPA) each body system warranting investigation. If you

assess the abdomen, however, the order will be inspect, auscultate, percuss, and palpate so as not to induce bowel sounds prior to auscultation.

Communication of your findings is one of your most important roles. Communication during a shift report or when delegating a task must be clear, concise, and complete, consisting of correct and up-to-date information. Think through what you will say, using your shift organizer to promote this careful approach. For example:

- You do not want to report to the next shift that your patient last had IM morphine 6 hours ago when you just discontinued the parenteral morphine and administered oral narcotic analgesics.
- Similarly, you do not want to delegate the task of assisting with a patient's meal if the patient's status will shortly change to NPO (nothing by mouth).

In Chapter 6 we reviewed important information to communicate during report. Later in this chapter we will review communication during delegation, to include the Five Rights of Delegation.

Now we explore coach quadrants related to work styles that affect communication. Many of us have experienced a communication event in which conflict occurred; for example, when two or more physicians or advanced practice nurses prescribed for different interests or goals. Conflict can occur as you communicate with many different people each shift and in stressful or emergent situations. Perspectives may be different but are usually not right or wrong. Participants in a potential conflict can reframe their positions by collaborating or compromising. Figure 7–2 depicts the coach quadrants related to work styles:

- **Collaboration** represents the ideal work style because solutions are win-win. Collaborative communication initially may take more time but actually saves time in the long run by preventing drawn-out review of conflict.
- **Compromise** is an acceptable work style because each party wins some and loses some. Compromise is particularly effective among peers.

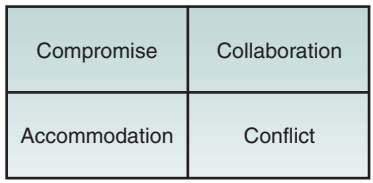


FIGURE 7-2: Window on work styles.

- **Accommodation** is less desirable, although common, because one party gives in, resulting in a lose-win outcome. Accommodation is the stereotypical nursing work style, which is correctable through empowerment and competent negotiation and collaboration.
- **Conflict** is unprofessional because both parties lose "face" and respect. Conflict also requires energy to repair the damage. How much better to put that amount of energy toward collaboration or compromise!

If you encounter conflict and are not certain how to handle it, ask for help from your charge nurse or nurse manager. Many situations can be resolved through compromise, in which parties agree to disagree with one another while agreeing to do what is best for the patient.

COMMUNICATION

Why is communication important? People crave communication! In some studies, not to mention stereotypical perceptions, most people believe women speak more than men. Recently, however, Mehl and colleagues found that both genders speak on average about 16,000 words per day.

I-SBAR-R

Communicating effectively with others on the interprofessional health-care team is essential for quality patient care and patient safety. It is of particular importance in the event of a patient's changing condition. The Institute for Health Care Improvement as well as the Joint Commission endorse the quality and safety communication technique called SBAR, pronounced "ess-bar," which stands for *S*ituation, *B*ackground, *A*ssessment, and *R*esponse. Numerous hospitals, as well as the military and some airlines, use this system to facilitate rapid, accurate communication among team members (Fig. 7–3).

SBAR is an easy communication method and useful for framing any routine for critical interprofessional health-care conversation. The situation *(S)* is the current problem or reason for communicating with the health-care provider. The background *(B)* provides important elements from the patient's past or current medical history and physical examination. The assessment *(A)* is the nurse's assessment of the situation. The response *(R)* shares recommendations for patient-centered, evidence-based, quality care.

Recently, Grbach and the initiative called Quality and Safety Education for Nurses (QSEN) made recommendations to strengthen the original SBAR communication and to support the Joint Commission's NPSG through 2009. The new acronym, I-SBAR-R, was developed, in which *I = Introduce*

SBAR report to physician about a critical situation

S	**Situation** **I am calling about** <patient's name and location> **The patient's code status is** <code status> **The problem I am calling about is** _____. I am afraid the patient is going to arrest. **I have just assessed the patient personally:** **Vital signs are:** Blood pressure ____/____, Pulse____, Respiration____, and Temperature____ **I am concerned about the:** Blood pressure because it is over 200 or less than 100 or 30 mm Hg below usual Pulse because it is over 140 or less than 50 Respiration because it is less than 5 or over 40 Temperature because it is less than 96 or over 104
B	**Background** **The patient's mental status is:** Alert and oriented to person, place, and time Confused and cooperative or non-cooperative Agitated or combative Lethargic but conversant and able to swallow Stuporous and not talking clearly and possibly not able to swallow Comatose. Eyes closed. Not responding to stimulation. **The skin is:** Warm and dry Pale Mottled Diaphoretic Extremities are cold Extremities are warm **The patient is not or is on oxygen.** The patient has been on ____ (L/min) or (%) oxygen for____ minutes (hours) The oximeter is reading ____% The oximeter does not detect a good pulse and is giving erratic readings
A	**Assessment** **This is what I think the problem is:** <say what you think is the problem> **The problem seems to be cardiac infection neurologic respiratory** _____ **I am not sure what the problem is but the patient is deteriorating.** **The patient seems to be unstable and may get worse; we need to do something.**
R	**Recommendation** **I suggest or request that you** <say what you would like to see done>. Transfer the patient to critical care. Come to see the patient at this time. Talk to the patient or family about code status. Ask the on-call family practice resident to see the patient now. Ask for a consultant to see the patient now. **Are any tests needed:** Do you need any tests like CXR, ABG, EKG, CBC, or BMP? Other? **If a change in treatment is ordered, then ask:** How often do you want vital signs? How long do you expect this problem will last? If the patient does not get better, when would you want us to call again?

FIGURE 7-3: SBAR handout.

(self and patient) and *R = read back* (orders). Compare results between haphazard communication and I-SBAR-R in the following scenarios.

Example: Non-I-SBAR-R

"This is Sheila calling about Ms. Smith. She's now putting out 400 cc of blood-tinged discharge per hour from her NG tube. Her heart rate is a little higher than it has been. Her temperature is stable. I'm not sure what her BP is. I think she had labs drawn this morning, but I can't find the chart. She just doesn't look good to me." The physician gave orders and the nurse replied, "OK, I'll get these done and call back later."

Analysis Using Critical Thinking

I: Introduction: Was it complete?

S: Situation: Was it complete? What changed?

B: Background: When was this patient admitted? When did she have surgery?

A: Assessment: What other information did the physician need?

R: Response: Do you know what the physician said?

R: Read back: Did the nurse read back any orders to the physician?

Same Example: Using I-SBAR-R

"Hello, Dr. Winter, this is staff nurse Sheila Jones from University Center Hospital on the surgical unit. I am calling about Ms. Sara Smith whom you admitted 48 hours ago. She has put out 400 cc of blood-tinged discharge over the last 4 hours from her NG tube. She is 24 hours post-op colon resection and had put out a total of 400 cc bile-colored drainage from her NG tube in the first 20 hours. Her heart rate is up to 116 bpm from 90 and her BP is down to 90/60 mm Hg from 130/76. I would like to draw a stat CBC, type and crossmatch, and obtain an abdominal CT." *(Dr. Winter gives Nurse Jones orders.)* "OK Dr. Winter, I will order a stat CBC, type and crossmatch for 2 units packed RBCs, and an abdominal CT. I will call you with the results as soon as they are available."

Analysis Using Critical Thinking

I: Introduction: Was it complete?

S: Situation: Was it complete? What changed?

B: Background: When was this patient admitted? When did she have surgery?

A: Assessment: What other information did the physician need?

R: Response: Do you know what the physician said?

R: Read back: Did the nurse read back any orders to the physician?

The use of this standardized communication ("hand-off technique") will become second-nature to you after some practice. Each item of the I-SBAR-R communication will help you more accurately report the situation and

EVIDENCE FOR PRACTICE

The Joint Commission endorses the use of SBAR [Haig, K. M., Sutton, S., & Whittington, J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Joint Commission Journal on Quality and Patient Safety, 32*(3), 167–175.] In 2008, the Robert Wood Johnson Foundation initiative known as Quality and Safety Education for Nurses (QSEN) further improved interprofessional communication by adding introductions (I) and readback (R) to create a safer model, called I-SBAR-R . These additions satisfy the Joint Commission's 2009 Hospital NPSG 02.01.01.

facilitate the physician or advanced practice nurse to make safe, quality health-care decisions.

Delegation

Delegation is the process of working with and by means of another member of the health-care team to complete patient care. The National Council of State Boards of Nursing defines delegation as the transfer of a specific nursing task, in a specific situation, by a nurse to another competent health-care provider. As this definition also states, the nurse delegating the task remains accountable for the completion, evaluation, and documentation of that task. In addition, as the nurse learns the art of delegation, he or she begins with the patient's preferred outcomes in mind.

The Five Rights of Delegation and Assignment are helpful. The rights are (1) the right circumstance with (2) the right task assigned to the (3) right health-care provider using (4) the right direction (clear, concise, correct, complete communication), with (5) the right supervision. An RN can delegate only some daily tasks performed in patient care. The RN cannot delegate aspects of the nursing process, clinical judgments, or interventions that require professional nursing knowledge, judgment, or skill (counseling, patient/family education, skills outside the provider's scope of practice). Moreover, the RN must reassess delegated tasks during a shift when a patient's condition changes.

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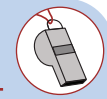

Delegation is a key aspect of leadership. Delegation allows you to make the best use of your time and skills, and it helps other people on the health-care team grow and develop to reach their full potential.

Documentation

Nearly every encounter with a patient requires documentation. Accrediting bodies, state licensing laws, and your state's nurse practice act legally mandate a nurse's documentation of the following:

- Communication with patients, families, and health-care providers
- Outcomes of the nursing process: after every assessment, implementation of an intervention, evaluation of an intervention, and patient education session
- Delegation and follow-up of tasks

Problem-oriented medical records (POMRs) provide all members of the health-care team a way to document their involvement in patient care. Many facilities utilize standard forms, computer records, checklists, or charting by exception. Whatever is the standard for your unit is the documentation format you will use to communicate effectively. Becoming familiar with the guidelines of documentation is essential to your safe and legal practice. The Four Cs of Communication will help you communicate effectively:

1. Clear
2. Concise
3. Correct
4. Complete

Every health-care agency maintains policies and procedures related to documentation. Some facilities document on paper, whereas others have converted to electronic medical records. Many patient charts continue to use source-oriented documentation, with each profession completing different sections of the chart. Other facilities use POMRs, on which anyone on the interprofessional health-care team involved in the patient's care charts in the same section and on the same progress notes. This method provides a sequencing of events or care provided to the patient regardless of who provides the care.

Several tools are available for documenting and communicating your findings.

- SOAPIE: *S* = Subjective data, *O* = Objective data, *A* = Assessment or nursing diagnosis, *P* = Plan to affect the human response to this health problem, *I* = Intervention used, *E* = Evaluation of the effectiveness of the intervention and resolution of a nursing diagnosis
- PIE: An abbreviated version of SOAPIE communicates the *P* = Problem or nursing diagnosis, *I* = Intervention, and *E* = Evaluation completed by the nurse

- DAR: *D* = Data; *A* = Action, or the intervention used to affect the problem; and *R* = response, similar to an evaluation of the action or intervention
- CBE = Charting By Exception, which some facilities use with focused or narrative charting for abnormal findings; checklists document normal and abnormal findings, and the nurse explains abnormal findings more thoroughly in a narrative form in the progress or nurse's note

Regardless of the documentation method, the following guidelines apply:

- Verify you have the correct chart before you begin writing.
- Use black ink, and write legibly.
- Date and time every entry and every page without skipping lines or leaving blanks.
- Use objective, factual, complete documentation; avoid judgmental statements.
- Document care, medications, treatments, or procedures as soon after their completion as possible. Do NOT document in advance—perhaps you may leave the unit before giving a medication, key equipment breaks down, or a procedure is canceled.
- Document the patient response to all interventions.
- Document consent or refusal of treatment.
- Document telephone calls, messages, and orders.
- Sign your name and title with each entry.
- Use quotations as appropriate in subjective data.
- Follow your agency's policy for late entries and errors. In general, nurses cross out any errors with one line, to prevent obliterating an entry, and date and initial the correction.
- Use correct spelling, punctuation, and grammar.
- Use only accepted abbreviations.
- Maintain privacy and confidentiality of documented information.

ALERT

Have you heard the phrase, "If it isn't documented, it wasn't done"? Courts of law have upheld this statement. For example, if you say you assessed a patient's toes for color, movement, and sensation, yet the patient's cast was constricting blood flow and the patient lost his or her foot, a court can find you responsible if you did not document your findings.

CLINICAL VOICE: INTERPROFESSIONAL COMMUNICATION

The importance of interprofessional communication comes to light in the following case study.

I was working as a charge nurse on a medical/surgical unit when notified that a patient was being admitted from the PACU s/p vaginal hysterectomy. The patient was coming to our unit because the gynecology floor was full. We were told she was an 18-year-old who had had an uneventful PACU course. I assigned her to a very experienced LPN for her care while I would complete her post-op admission assessment and hang any IV fluids. The patient was brought to the unit accompanied by her mother.

The hallway report explained that the 18-year-old female was deaf and could not speak. Her VS had been stable throughout her stay in the PACU. Her surgeon would visit her in the morning. Her mother translated using sign language that she was tired and wanted to sleep. I completed an assessment and left her with the LPN and CNA to complete VS every 15 minutes.

Over the next hour, the patient's blood pressure slowly dropped, and her heart rate slowly increased. She remained sleeping but easily aroused. She had no vaginal discharge and no additional urine output. Her mother was no longer in the room with her, so I sent another staff member to look for her. I had a bad feeling that something was wrong and worried she was bleeding internally. I assigned a CNA to remain with the patient and to continue to measure her VS every 15 minutes. I gathered my facts and paged the surgeon.

The surgeon called back and listened to my concerns. She said she had an office full of patients and could not come to see the patient. As I hung up the phone the LPN returned to say the patient's VS were worsening, and I quickly went to assess the patient. Her VS were now: BP 80/40, pulse 126 bpm, and respirations shallow at 26. We placed her in a Trendelenburg position, and I called the surgeon and my nurse manager. My nurse manager arrived as I completed the call with the surgeon. Again, the surgeon stated she could not come to see the patient. She gave no new orders. After a brief conversation and another set of VS the decision was made to move up the "chain of command." The chief of surgery happened to respond, came to assess the patient, ordered 2 units of packed RBCs, and transferred her to the ICU. She went to surgery, where more than 1 L of blood was found in her pelvis. A bleeder was cauterized, and the patient recovered without incident.

That day I learned how much we need our communication skills to effectively communicate with our colleagues. I realized, after debriefing with my nurse manager, that I did not say specifically to the surgeon, "I need you to come and see your patient now. If not, I will follow up the chain of command." If I had communicated more effectively, I could have enlisted help sooner. Thankfully, the patient received the care needed and did not suffer any negative outcomes.

Chapter Summary

In summary, the nursing skills of communicating, delegating, and documenting are as important to learn as starting an IV, ambulating a patient, or completing a sterile dressing change. The technique of I-SBAR-R supports the four Cs of communication (clear, concise, correct, and complete) in relating a change in patient condition to a physician, advanced practice nurse, or other member of the health-care team. Communication in delegation supports safe, quality, patient-centered care when the delegating nurse clearly explains the tasks and provides timely follow-up and documentation.

CHAPTER 8

Critical Nursing Actions: Responding to Key Situations

A patient's progress toward attainment of desired outcomes is the focus of the American Nurses Association (ANA) Standards of Care regarding nursing assessment, diagnosis, outcome identification, plan, implementation, and evaluation. These familiar standards comprise the nursing process and its component parts. This chapter focuses on three critical nursing actions:

1. Responding to changing patient conditions
2. Managing pain
3. Providing end-of-life care

Attention to these areas not only will accelerate your practice from novice to advanced beginner to competent but also will make you stand out among your peers. Agencies consistently report shortcomings among nurses for these actions in their first few years of practice.

We first describe what to do in the process of a changing patient condition and reinforce the use of I-SBAR-R, introduced in Chapter 7, to communicate assessments. We then focus on advanced strategies for managing patients' acute and chronic pain. In the last section, we address the unfamiliar territory of hospice, palliation, and end-of-life care of patients and their families.

Responding to Changing Patient Conditions

Essential to standards-driven communication is notifying physicians of changing patient conditions in accordance with National Patient Safety

Goals. These goals focus on the problems identified in health-care safety and how to resolve them to improve patient safety. Guidelines for improving interprofessional communication cover the following important questions:

- When should the nurse notify a physician?
- What change in a patient's condition has occurred?
- How best to communicate that change?

Beginning as a nursing student, you must communicate swiftly and accurately with your preceptor or clinical instructor. Your precepting nurse will then communicate with the patient's attending physician, consulting specialists, residents, and family members to relay any change assessed in a patient. Reasons to contact a physician commonly occur with changes in the circulatory, neurological, respiratory, gastrointestinal, or musculoskeletal systems. Table 8–1 lists some of the most important criteria for informing the physician when a patient experiences a change in condition. For example, it is important to notify the physician:

- If a patient's blood pressure (BP) changes from a baseline of 120/70 mm Hg to 90/50 mm Hg.
- If a patient who has been resting comfortably now complains of chest pain and shortness of breath.
- If a patient can no longer move one or more extremities.

In Chapter 7 we introduced the situational communication model called I-SBAR-R for the members of an interprofessional health-care team. The following example describes the use of I-SBAR-R in an acute change in a laboratory value and associated change in the patient's mental status:

*I*ntroduction: "Hello, Dr. Summer, this is Charge Nurse Harry Jones from University Center Hospital's MICU. I am calling about Mr. Emmett Washington whom you admitted this morning."

*S*ituation: "Mr. Washington's blood glucose at 1100 was 500 mg/dL."

*B*ackground: Mr. Washington is a 55-year-old black male admitted status post (s/p) acute myocardial infarction (AMI). He has a history of coronary artery disease (CAD), hypertension (HTN), dyslipidemia, and type 2 diabetes mellitus (DM).

*A*ssessment: His vital signs (VS) are stable, but his blood glucose levels have increased from 237 mg/dL at 0700 to 320 mg/dL at 0900 to 500 mg/dL at 1100. He is also lethargic. He is currently receiving a regular insulin intravenous (IV) drip at 2 U/hr.

Table 8–1 Criteria for Notification of Patient Condition

CIRCULATORY SYSTEM	Unexplained drop or rise in BP	Sustained drop in urine output (UO) <30 mL/hr	Uncontrolled hemorrhage	New onset cardiopulmonary (CP) or acute electrocardiogram (ECG) changes
NEUROLOGICAL SYSTEM	Change in level of consciousness (LOC), speech, alertness, sensation, movement	Acute change in Glascow Coma Scale	New-onset or uncontrolled seizures	
RESPIRATORY SYSTEM	Decreased oxygen (O_2) saturation requiring increase in O_2 (i.e., from nasal cannula [NC] to mask)	Acute change in chest tube drainage or bubbling	Acute changes in breath sounds or in respiratory rate or pattern	
GASTROINTESTINAL SYSTEM	Blood in emesis or stool	Sustained drop (>2 hr) in UO <30 mL/hr	Acute abdominal distention, uncontrolled vomiting	Increasing complaint of (c/o) abdominal pain
MUSCULOSKELETAL SYSTEM	Color, movement, sensation (CMS) check indicating lack of pulses, cool extremities, acute swelling, change in sensation		Sudden inability to move or weakness of extremity	

Continued

Table 8–1 Criteria for Notification of Patient Condition—cont'd				
OTHER: MEDICATIONS	Drug reaction	Medication error		
ACUTE LABORATORY TEST CHANGES	BS, aPTT, PT/INR	White blood cells (WBCs), hemoglobin and hematocrit (H&H) levels, potassium (K+), calcium (Ca++)		
METABOLIC	Acute change in temperature; blood sugar (BS)			
SURGICAL	Dehiscence of wound or evisceration of organs	New or increasing wound erythema		
DISRUPTION OF TUBES	Clotting of central line access; dislodged surgical drainage device; nasogastric (NG), Dobhoff tube, etc., swelling or tenderness at insertion site	Change in peripherally inserted central catheter (PICC) line position or status, disruption of/change in position of chest tube		
PATIENT FALLS	Together with completion of incident/occurrence report			

*R*esponse/*R*ecommendation: "I am concerned that the patient's blood glucose will continue to rise unless we increase his insulin dose."

*R*ead back: (Dr. Summer gives Nurse Jones orders and...): OK, Dr. Summer, I will write the order to increase the insulin drip to 5 units per hour and repeat a stat blood draw for glucose level in two hours. I will call you with the results as soon as they are available."

Analysis Using Critical Thinking

I: Was it complete?

S: Was it complete? What changed?

B: When was this patient admitted? How rapidly did his blood glucose level increase?

A: What other information did the physician need?

R: Do you know what the physician said?

Read as many I-SBAR-R briefings as possible to accelerate your mastery of this patient safety communication technique and to improve your ability to respond confidently to changing patient conditions. The Web site on Quality and Safety Education for Nurses (www.qsen.org) provides examples; other examples are emerging in clinical nursing journals.

Managing Pain: Pathophysiology and Patient Care Strategies

Well-controlled pain is one of the most nurse-sensitive patient outcomes and a major contributor to patients' satisfaction with health-care delivery. Even though many nursing textbooks refer to pain as the fifth vital sign, it is not a sign at all. Pain is a symptom that cannot be measured objectively. It is an unpleasant sensory or emotional experience associated with actual or potential tissue damage. Pain is also whatever a patient says it is. Health-care providers and patients themselves commonly undertreat pain, which can lead to chronic pain. Chronic pain alters the daily processes of life in all of these areas:

- Physiological
- Psychological
- Sociocultural
- Behavioral

Because of these far-reaching implications, it is essential to accelerate your understanding of the pathophysiology of pain and effective strategies for managing pain.

Pain occurs through the *transduction, transmission, perception,* and *modulation* of messages sent via the peripheral nervous system (PNS) and central

nervous system (CNS). *Transduction* is the reception and transfer of the sensation called pain from the site of injury to the CNS. Nociceptors in tissues are stimulated by mechanical, thermal, or chemical injury and transmit information to the CNS. These nociceptors are in the skin, subcutaneous tissues, joints, artery walls, and internal organs and respond, via nerve signals, to various stimuli. Tissue trauma (mechanical stimulus), extreme cold or heat (thermal stimulus), or tissue ischemia (chemical stimulus) causes the release of cell breakdown products and inflammatory mediators. Any of these substances can activate nociceptors. The result is pain.

Once transduction of pain has occurred, *transmission* of pain to the spinal cord and brain follows unless inhibited (Fig. 8–1). The electrical conduction of pain transmits along two types of primary afferent nerve fibers, which carry impulses toward the spinal cord and CNS. A-delta fibers transmit sharp, stabbing, or intermittent pain rapidly along a nerve's myelinated sheath. C fibers are responsible for slow transmission of pain signals, resulting in constant, dull, aching pain. The afferent nerve fibers transmit impulses to the dorsal horn of the spinal cord. In the dorsal horn, transmission of pain either continues on to the brain or is inhibited. Several substances either activate or inhibit further transmission. Once nerve

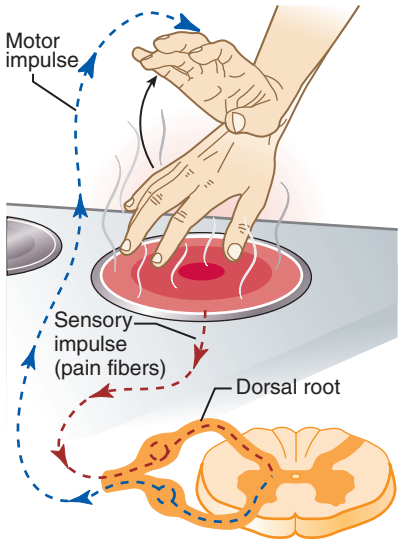

FIGURE 8-1: Pain transmission.

signals leave the spinal cord, they reach the thalamus, somatosensory cortex, limbic system, and frontal cortex of the brain. The patient perceives and interprets this electrical stimulus as pain (somatosensory cortex), experiences an emotional response to the pain (limbic system), and thinks about the cause of pain (frontal cortex).

Next, the patient becomes aware of, or *perceives,* pain. All humans possess the same **pain threshold,** or the point at which a stimulus is painful. But everybody has different **pain tolerances**. Past experiences with pain as well as an individual's psychosocial and cultural makeup shape a person's tolerance to pain (Table 8–2).

Pain *modulation* and sensitization occur during the process of recognizing pain. Analgesia or competing pain stimuli can modulate or adjust the

Table 8–2 Cultural and Ethnic Variations in Response to Pain

CULTURAL GROUP	RESPONSE TO PAIN
African American	Pain is a sign of illness or disease. Absence of pain may affect compliance with treatment (i.e., may not take medication as prescribed unless pain present). Pain is considered inevitable and must be endured. Spiritual and religious beliefs account for high tolerance to pain. Persistent pain is associated with little faith. Prayer and laying on of hands are used to treat pain.
Appalachian	Pain is endured and accepted stoically. Believes use of objects can rid pain (e.g., knife or ax under the bed to "cut out" pain).
Arab American	Pain considered unpleasant and something to be controlled. Expression of pain less with strangers and more with family; send conflicting perceptions of pain. Confidence in Western medicine, expects immediate relief of pain.
Chinese American	Description of pain more diverse in terms of body symptoms, such as pain more dull and diffuse. Explain pain from the traditional influences of imbalances in *yin* and *yang*. Cope with pain using oils, massage, warmth, sleeping on affected area, relaxation, and aspirin.

Continued

Table 8–2 Cultural and Ethnic Variations in Response to Pain—cont'd	
CULTURAL GROUP	**RESPONSE TO PAIN**
Cuban American	Pain is a sign of physical problem that warrants traditional or biomedical healer. Response to pain very expressive (i.e., crying, moaning, groaning), considered a pain-relieving function.
Egyptian American	Avoid pain and seek prompt treatment. Expression of pain less with strangers and more with family; send conflicting perceptions of pain. Description of pain more generalized. Age and birth order correlate with individual responses and description of pain (e.g., younger children and first-born more expressive about pain). Helpful to have close family member present during pain episodes, preferably woman, who is seen as more nurturing, caring, and capable of comforting patient in pain.
Filipino American	Pain considered part of living an honorable life. Pain considered as means to atone for past transgressions and achieve fuller spiritual life. Response to pain stoic, tolerant of great amount of pain. May need to encourage use of pain interventions. May use prayer in pain management.
French Canadian	Pain described as more intense; described more effectively.
Greek American	Pain *(ponos)* considered cardinal symptom of ill health. Pain considered evil and needs to be eradicated. Family relied on to find resources to relieve pain. Physical pain expressed publicly, but emotional pain kept within privacy of family.
Iranian	Expressive about pain. Men more stoic than women in expressing pain. May justify pain in light of later rewards after death.
Irish American	Stoic response to pain; may ignore or minimize pain. Denial of pain may delay treatment.
Jewish American	Preservation of life paramount; therefore seek immediate treatment for pain. Verbalization of pain is acceptable and common. Want relief from pain and to know cause.

Table 8–2 Cultural and Ethnic Variations in Response to Pain—cont'd

CULTURAL GROUP	RESPONSE TO PAIN
Mexican American	Good health associated with being pain-free. Pain considered necessary part of life. Obligated to endure pain in performance of duties. Type and amount of pain divinely predetermined. Pain and suffering considered consequences of immoral behavior. Methods used to relieve pain maintain balance within person and environment. Perceptions of pain may delay seeking treatment.
Navajo Indian	Pain must be endured, leading to inadequate pain control. May use herbal medications to treat pain.
Vietnamese American	Pain is endured, considered part of life. Cultural restraints against showing weakness limit use of pain medication.

Purnell, L. & Paulanka, B. (2003). *Transcultural Health Care: A Culturally Competent Approach,* ed. 2. Philadelphia: F.A. Davis.

sensation of pain (Fig. 8–2). People become sensitive to pain from peripheral or central processes. Peripheral sensation to pain occurs due to prolonged exposure to a painful stimulus. As exposure continues, the patient's pain tolerance lowers, resulting in an increased response to pain (hyperalgesia) or a sensation of pain to a nonpainful stimulus (allodynia). Central sensitization to pain also occurs with prolonged exposure. Although the mechanisms of these types of sensitization differ, any of them may result in chronic pain.

It is important to understand the pathophysiological development of pain because pharmacotherapy is geared to alleviating pain at its many different physiological triggers or other processes. Pain is also treated nonpharmacologically according to the different types of pain. Table 8–3 lists the types of pain along with causes, duration, effects on the patient, and examples of mechanical, thermal, or chemical stimulation that cause pain. Treatments vary depending on whether pain is acute, chronic, or malignant. Therefore, recognizing a patient's particular type of pain will help the health-care team plan for appropriate and responsive care.

In addition to a patient's self-report, the most important way to determine the type of pain is by recognizing its underlying pathophysiological cause. Two major divisions of pain are nociceptive and neuropathic pain.

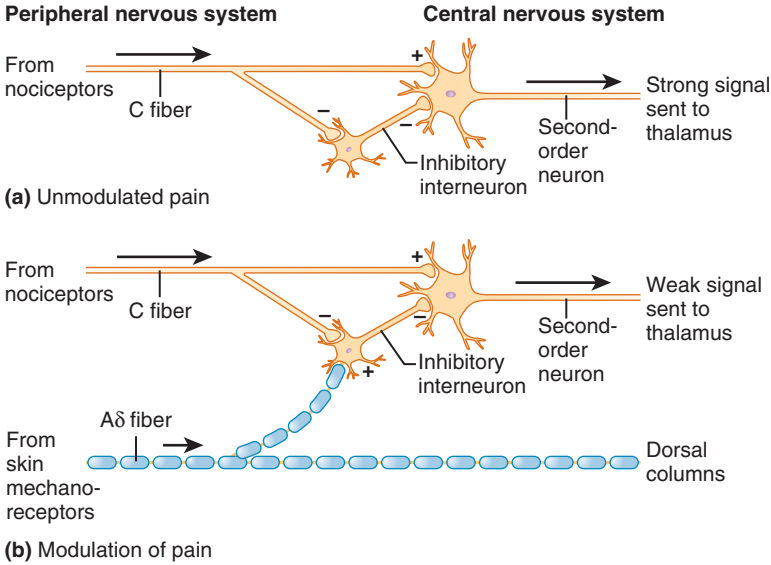

FIGURE 8-2: Gate Control Theory of Pain Modulation.

Nociceptive pain occurs with exposure to a mechanical, thermal, or chemical stimulus that produces tissue injury. It is a protective response to acute tissue damage. Nociceptive pain can present as visceral or somatic pain. Deep visceral pain occurs when an organ undergoes overdistention, traction, or spasms or experiences an ischemic event or inflammation. Visceral pain may be localized or diffuse (hard to point to) or cause referred or radiating pain to sites other than the site where the pain originated. Referral or radiation of pain often occurs due to shared nerve pathways between different sites. Typically, the quality of visceral pain is aching to sharp and stabbing and may be accompanied by autonomic nervous system signs and symptoms such as diaphoresis, nausea and vomiting, pallor, pupil dilation, tachycardia, tachypnea, increased blood pressure, and muscle tension. Somatic pain may originate in superficial or deep body structures. Superficial somatic pain originates in the skin or mucous membranes. Patients often characterize this kind of pain as sharp or burning. Tenderness on palpation along with hyperalgesia, hyperesthesia (increased sensitivity to sensory input or stimuli), and allodynia may occur. Deep somatic pain originates in muscles, bones, and joints of the

Table 8–3 Types of Pain, Causes, and Treatments

TYPES	CAUSES	TREATMENTS
Nociceptive—Mechanical	Arthritis, fractures, disc herniation, postsurgical, spinal stenosis, tension headache, muscle injury	Opioids and nonsteroidal anti-inflammatory drugs (NSAIDs), stretching, epidural or trigger point steroid injections, surgery
Nociceptive—Chemical	Kidney or gallstones, cardiac ischemia or infarct, stomach ulcer, Crohn's disease	Opioids, corticosteroids, surgical repair
Nociceptive—Thermal	Burns, frostbite	Opioids
Neuropathic	Diabetic neuropathy, postherpetic neuralgia, phantom limb pain, myofascial pain syndrome, disc herniation	Opioids, nerve-stabilizing agents (gabapentin, oxycarbazepine, zonisamide), epidural steroid injections, spinal blocks

body. This type of pain can be localized, diffuse, or radiating and may be caused by injury, ischemia, or inflammation from acute or chronic injury.

Neuropathic pain occurs after injury to the PNS or CNS. This type of pain provides no protective mechanisms against further tissue injury and often becomes the disease itself. Categories of neuropathic pain include

EVIDENCE FOR PRACTICE

An interprofessional group of researchers at Walter Reed Army Medical Center studied the effects of mirror, or visual illusion, therapy involving patients with phantom limb pain after the amputation of a leg or foot. Eighteen patients performed 15 minutes of movements with their intact limb and attempted movement of their amputated limb using mirror therapy, covered mirror exercises, or mental visualization. Every patient in the mirror or visual imagery group showed a decrease in overall phantom pain, number of pain episodes, and duration of painful episodes as compared with the other groups. The exact mechanism or reason behind the success of this intervention is not fully known, but further study is ongoing (see Chan et al., 2007).

mono/polyneuropathic pain, deafferentation pain, sympathetically maintained pain, and central pain. This type of pain is often chronic and debilitating.

Pain assessment is the cornerstone of pain control (see Chapter 3) and drives the cycle of the nursing process through intervention and evaluation of treatment effectiveness. This cycle includes a reassessment of pain characteristics and area of tissue injury. Current recommendations for reassessment of a patient include:

- Within 30 minutes after parenteral pain medications
- Within 1 hour after oral pain medication
- After any patient report of a change in pain level

The following section focuses on advanced strategies for managing patients' acute and chronic pain. Regardless of cause, patient, or type of pain, every patient deserves adequate pain control through attention to the following aspects of care:

- Assessment: objective physical findings, subjective reports of pain, and head-to-toe follow-up when findings are inconclusive
- Mutually set goals for pain management
- An interprofessional approach
- Nonpharmacological and pharmacological treatments
- Patient and family education about treatment modalities
- Prevention of adverse effects
- Evaluation of the effectiveness of all therapies

Drug therapy for pain control, whether for acute or chronic pain, includes nonopioid analgesic agents, opioid analgesics, and co-analgesics. Figure 8–3 lists the various analgesic modalities for treatment of pain according to severity. Pain management also may include interventional therapies and nondrug therapies. We encourage you to take the lead in your workplace by learning as much as you can about safe and effective pain management and attending to commonly occurring barriers (Box 8–1).

Nociceptive pain results from injury to skin, joint, muscle, or visceral tissue. It typically occurs from an acute injury and responds well to both NSAIDs and opioid analgesics. Mild to moderate pain, rated 1–4 out of 10, is treated with nonopioid analgesics such as aspirin, acetaminophen (paracetamol on the WHO Analgesic Ladder), or any of the classes of NSAIDs. Infrequently, oral or injected corticosteroids accompany pain management to help resolve inflammation. Nonpharmacological treatments include rest, ice, compression, and elevation (RICE) and stretching (Box 8–2).

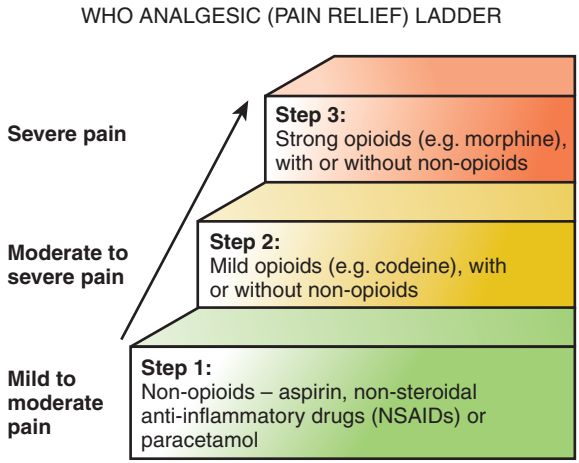

FIGURE 8-3: World Health Organization Analgesic Ladder.

Box 8–1 Barriers to Effective Patient Pain Management

Barriers to pain management for health-care providers:

- Lack of education
- Poor pain assessment skills
- Concerns over prescribing opioids (<1% of patients experience addiction)
- Concerns over respiratory depression as an adverse reaction
- Regulatory concerns

Box 8–2 Nonpharmacological Interventions

- RICE
- Heat therapy
- Relaxation, biofeedback
- Massage, stretches
- Transcutaneous electrical nerve stimulation (TENS) unit
- Percutaneous electrical nerve stimulation (PENS) therapy
- Acupuncture, acupressure
- Hypnosis
- Distraction
- Brace, splint, cast
- Exercise
- Surgery

More severe nociceptive pain, described by the patient as moderate to severe (rated 3–6 out of 10), likely will require both NSAIDs and moderate-strength opioid analgesics:

- Codeine
- Propoxyphene (Darvon)
- Hydrocodone (with Tylenol = Vicodin or Lortab)
- Oxycodone (with aspirin = Percodan; with Tylenol = Percocet, Roxicet, Tylox)

For acute pain, nonpharmacological treatments such as RICE and stretching may help relieve pain. For chronic pain, additional interventions might include massage, physical therapy, and/or epidural or trigger-point injections.

Severe nociceptive pain (rated 7–10 out of 10), as occurs with burns, trauma, kidney stones, or in the immediate postoperative period, requires strong opioids with or without nonopioid analgesics. Morphine is the gold standard for opioid analgesics. Other strong opioids include:

- Meperidine (Demerol)
- Methadone
- Heroin
- Fentanyl
- Hydromorphone
- Oxymorphone

Severe acute pain is protective to a patient as the pain limits movement and allows for healing. Nonpharmacological treatments such as RICE, relaxation, and distraction also may be effective adjuncts to analgesics for severe acute pain.

Neuropathic pain results from damage to nerves in the PNS or CNS. Causes of neuropathic pain include trauma, inflammation, metabolic diseases, infections involving the nervous system, tumors, toxins, and neurological diseases (see also Table 8–3). This type of pain is not protective and can develop into chronic, poorly controlled, mild, moderate, or severe and persistent pain. Often, neuropathic pain does not respond well to opioid analgesics, and other medications and nonpharmacological treatments are necessary to provide the patient with pain relief. Box 8–3 provides a list of drug classes used as co-analgesics. They work together with NSAIDs and opioids to enhance pain relief.

Box 8–2 indicates other interventions used with patients suffering from chronic pain. As a last resort, some patients and health-care providers elect surgical interventions in an attempt to resolve a patient's pain. New

EVIDENCE FOR PRACTICE

Researchers continuously test new drugs to enter the pharmaceutical market. One such drug, licofelone, has completed phase III trials as a new analgesic and anti-inflammatory agent in the treatment of osteoarthritis. This drug is first in a new class of drugs called COX/LOX inhibitors. In inflammatory processes the arachidonic acid cycle prepares for the release of many inflammatory agents that cause pain, warmth, redness, and swelling of the joint. In the past, the COX-1 and COX-2 receptor sites have been successfully blocked. For example, aspirin blocks both sites; celecoxib blocks only COX-2 sites. Licofelone blocks the 5-LOX sites, preventing the release of leukotrienes.

Box 8–3 Co-Analgesic Drugs Used to Treat Neuropathic Pain

- Tricyclic antidepressants (amitriptyline)
- Selective serotonin reuptake inhibitors (SSRIs) (fluoxetine)
- Lidocaine patches
- Antiseizure medications (gabapentin [Neurontin], carbamazepine [Tegretol])
- Capsaicin
- Anesthesia/blocks

therapies are evolving to treat even the most difficult types of neuropathic pain (see Evidence for Practice).

Boxes 8–4 and 8–5 display adverse effects of opioid analgesics and information related to opioid overdose, both of which need priority attention in the plan of care and patient education. Anticipation of unexpected events or anomalies promotes pattern recognition and prompt action in the event of their occurrence. The opioid antagonist naloxone (Narcan) reverses the signs and symptoms of opioid overdose and possibly saves the life of a patient who displays them. Patients who receive this intervention, however, also feel immediate pain. Secure a new but altered course of analgesics as close to the administration of an opioid antagonist as possible.

Box 8–4 Adverse Effects to Watch for in Patients Taking Opioid Analgesics

- Respiratory depression
- Constipation
- Orthostatic hypotension
- Urinary retention
- Biliary colic
- Cough suppression
- Emesis
- Increased intraocular pressure (IOP)
- Miosis
- Euphoria or dysphoria
- Sedation

Box 8–5 Opioid Overdose: Signs and Symptoms and Treatment

Classic triad of overdose:

- Coma
- Respiratory depression
- Pinpoint pupils

Treatment:

- Ventilatory support
- Opioid antagonist: Naloxone (Narcan)

Providing End-of-life Care

In 1997 the Institute of Medicine reported on the need to improve end-of-life (EOL) care. That same year, the American Association of Colleges of Nursing and a group from the City of Hope National Medical Center came together to outline nursing competencies important in the provision of quality EOL care. These pioneers, called the End of Life Nursing Education Consortium (ELNEC), have educated thousands of nurses in quality EOL care according to the consensus document titled *A Peaceful Death: Recommended Competencies and Curriculum Guidelines for End-of-Life Care.* This document focuses on alleviating suffering and promoting comfort at the end of a patient's life.

Assessing patients for advance directives and EOL care wishes is as essential as asking patients about their past medical history or known allergies.

Unfortunately, many nurses have not acquired the knowledge, skills, and attitudes regarding advance directives and EOL care to attend fully to these important patient needs. In this section we clarify terms associated with palliative and EOL care (Table 8–4). We also review the importance of maintaining patients' quality of life regardless of their disease, prognosis, or ability to pay. Next, we present an in-depth discussion regarding the use of palliative care in the chronically ill patient and explore a synopsis of the signs and symptoms of impending death and care to provide at the time of death. The chapter concludes with an overview of organ donation or procurement and care of the bereaved.

Table 8–4 Terminology Related to EOL Care

TERMINOLOGY	DEFINITION	AUTHOR OF DEFINITION
Palliative care	Active total care of patients whose disease is not responsive to curative treatment. Prevent, relieve, reduce, or soothe the symptoms of disease or disorder without effecting a cure.	WHO Institute of Medicine (IOM)
EOL care	Holistic care provided explicitly during the final weeks of life when death is imminent.	Ferrell and Coyle
Hospice care	Program of care that supports the patient and family through the dying process and the surviving family members through bereavement.	Hospice Foundation of America
Peri-death nursing care	Process of dying and death comprising a series of biological and emotional changes.	Matzo
Active dying	Process of total body system failure.	Pitorak

Continued

Table 8–4 Terminology Related to EOL Care—cont'd		
TERMINOLOGY	**DEFINITION**	**AUTHOR OF DEFINITION**
Prognosis	To determine the course that a disease may take from a point in time until death, including an understanding of the disease processes and trajectories as well as of end-stage indicators.	Matzo
Transition point	Event in the trajectory or course of an illness that moves a patient closer to death.	Matzo
Patient Self-Determination Act	Amendment to the Omnibus Budget Reconciliation Act of 1990; requires Medicare/Medicaid agencies that provide health care to notify patients they have the right to: participate in and direct their own health-care decisions, accept or refuse medical or surgical treatment, prepare an advance directive, and receive information regarding the provider's policies that govern the utilization of these rights.	U.S. Congress
Patient Bill of Rights	Statement of the rights to which patients are entitled as recipients of medical care: information disclosure, choice of provider/plan, access to emergency services, participation in treatment decisions, respect and nondiscrimination, confidentiality, ability to appeal, consumer responsibilities.	American Hospital Association

Table 8–4 Terminology Related to EOL Care—cont'd		
TERMINOLOGY	**DEFINITION**	**AUTHOR OF DEFINITION**
Dying Person's Bill of Rights	Be treated as a human being, maintain sense of hopefulness, express feelings, participate in care decisions, realize comfort goals, not to die alone, be free from pain, die in peace, have questions answered honestly, not be deceived, receive help for family, receive respect for body after death.	Southwestern Michigan Inservice Education Council Workshop
Do Not Resuscitate (DNR) order	A type of advance directive requesting not to receive cardiopulmonary resuscitation in the event of a cardiopulmonary collapse.	American Academy of Family Physicians
Durable power of attorney for health care	A type of advance directive stating whom the patient has chosen to make health-care decisions in the event the patient cannot make his or her own medical decisions	American Academy of Family Physicians
Living will	A type of advance directive and legal document describing what medical or life-saving treatments the patient agrees to if he or she becomes seriously or terminally ill.	American Academy of Family Physicians
ELNEC	Curriculum that addresses the critical aspects of EOL care: palliative care, pain management, symptom management, ethical and legal response, cultural considerations, communication, grief, loss, bereavement, quality EOL care, and care at the time of death.	American Association of Colleges of Nursing and City of Hope National Medical Center
Thanatology	Study of death.	DeSpelder and Strickland

The Patient Self-Determination Act (PSDA) of 1990 obligated health-care providers to ask patients upon admission to a health-care facility about their understanding of advance directives. Many patients and facilities have promoted patient self-determination in EOL care by means of the following directives:

- DNR order
- Patient Bill of Rights
- Durable power of attorney for health care
- Living will
- Dying Patient's Bill of Rights

LEADING CAUSE OF DEATH IN AMERICANS IN 2006

Heart disease
Cancer
Stroke
Chronic obstructive pulmonary disease (COPD)
Accidents (unintentional injury)
Alzheimer's disease
Diabetes mellitus

The DNR order reflects what the terminally ill patient *does not* want done to prolong life. Many health-care providers believe it gives a negative, crisis-oriented connotation to the patient, family, and members of the interprofessional health-care team. The DNR order implies no further interventions will occur when illness begins to overwhelm bodily functions. This assessment, however, becomes murky given that six of the seven leading causes of death are due to chronic disease.

A recent revision of the DNR order, called Allow Natural Death (AND), describes what *will* occur if resuscitation attempts are needed. This welcome change focuses on alleviating suffering and providing care to comfort a patient. This order reassures patients, families, and members of the health-care team of every effort to keep patients comfortable, promote palliation, and provide for early discussion of EOL choices rather than crisis interventions during an arrest. This type of order assists in providing EOL care to those suffering from long-term chronic illness in which a steady decline, punctuated by exacerbations, often ensues.

In 2004 EOL care expert Matzo described the process of death and dying as "peri-death." Similar to the process of a surgical intervention (preoperative, intraoperative, and postoperative phases = perioperative period) the peri-death period encompasses the process of biological changes, signs and symptoms, beliefs, or responses at any step in the process of dying. Peri-death may last days, months, or years and includes a prolonged decline in health, a steady decline due to an acute terminal illness, or a sudden death.

The death phase includes pronouncement of a patient's death, post-mortem care, organ procurement, and care of survivors. It is important to

consider physical, psychosocial, cultural, and spiritual needs of patients as well as survivors. After a patient's death, the care of survivors continues according to the agency involved in EOL care and may last minutes to years.

The first phase of peri-death is the diagnosis of:

- An acute, terminal illness (e.g., pancreatic cancer)
- Exacerbation and end-stage events of a chronic illness (e.g., chronic kidney disease from type 2 diabetes mellitus)
- Sudden death of a patient from an injury or acute illness (e.g., motor vehicle accident or bacterial meningitis)

This initial phase occurs when death is inevitable and life-preserving measures are withdrawn. Interventions to provide comfort and alleviate fear become the most important nursing actions. Patients have reported their fear of dying comes from concerns about lack of pain control, dyspnea, and emotional distress from burdening their family or dying alone. Nurses address these concerns through patient advocacy, encouraging all members of an interprofessional health-care team to work together to alleviate suffering and allay patients' fears as death approaches.

Actively dying patients show specific signs and symptoms as their physiological processes deteriorate. Peripheral edema, difficulty swallowing, and emotional withdrawal are common. The time it takes for a patient's body systems to shut down can occur in as few as 24 hours and as long as 10–14 days. Table 8–5 provides an explanation of this deterioration for each body system.

As a patient nears death, the nurse and the family members can watch for predictable signs and symptoms of impending death:

- Change in the patient's level of consciousness
- Death rattle
- Respirations with mandibular movement
- Cyanosis to the extremities
- Inability to palpate the radial pulse

Before these signs occur, ask your patients and family members if they would like to share stories of the past, discuss burial wishes or organ donation (Table 8–6), or say good-bye. Once death nears, it becomes more difficult for patients to communicate and for the nurse or family members to understand patients' faltering speech. Additionally, seek to understand the wishes of family members near the time of death. This proactive approach educates family members about the nurse's role as patient advocate and allows both patients and survivors to experience death as close to their expectations as possible.

Table 8–5 Body System Failure on Imminent Death		
BODY SYSTEM	**SIGNS AND SYMPTOMS**	**PATHOPHYSIOLOGY**
Cardiovascular	Decreased blood volume; quiet Korotkoff sounds Early: Tachycardia Late: Bradycardia and low BP Decrease in peripheral circulation; clammy; becomes mottled in appearance over soles of feet and bony prominences (late) Cool skin; normal core temperature Delirium Edema, nausea, pain	Dehydration; difficulty swallowing fluids Hypoxia; dehydration; decreased blood volume Slowing metabolism Dehydration Third-spacing of fluids
Respiratory	Diminished and/or adventitious breath sounds; "death rattle" (late) Air hunger and restlessness (dyspnea) Irregular and shallow respirations alternating with apnea	Impaired cardiac function; lymphatic and pulmonary congestion with decreased protein levels in the blood As above Increased levels of CO_2
Musculoskeletal	Weakness, mouth droop, difficulty swallowing; muscles of tongue and soft palate sag; gag and clearing of pharynx decrease (late) producing "death rattle"	Poor nutritional status for effective muscle strength and functioning
Renal	Decreased urinary output Incontinence	Decreased cardiac output Muscles of sphincters relax
Other	Fear, pain, social withdrawal Agitation/delirium	Psychosocial and cultural beliefs Electrolyte or glucose abnormalities, organ failure, drugs, stool impaction, infections, metastases

Table 8–6 Organ Donation and Procurement	
QUESTIONS	**ANSWERS**
What national organizations are involved in organ transplantation?	United Network for Organ Sharing (UNOS) Organ Procurement and Transplantation Network (OPTN)
Who can donate?	Living donors; donation after brain death; donation after cardiac death
What are the absolute exclusions to organ donation?	HIV-positive Active cancer Systemic infection
What can be donated?	Whole body, organs, tissue, stem cells, blood
When can donation occur?	Living donors; donation after brain death; donation after cardiac death
Where does organ transplantation take place?	Transplant centers across the country
How can patients help?	Patients make family aware of their wishes; nurses discuss option with patients and their families
Why is the need so great?	As of August 1, 2008, 99,252 patients were in need of a transplant; during the first 5 months of 2008, 5800 people donated an organ

Nurses typically witness death more frequently than most individuals. Family members who have never lost a loved one may be inconsolable or have unexpected actions, such as shaking a patient to "wake him up," hitting another family member for explaining their loved one has died, or climbing into the hospital bed to hold the patient. At the time of death, it is important for the nurse to express sympathy to family members by saying, "I am sorry for your loss." Ask survivors if they would like some time with the deceased. Allow time for them to grieve together in the presence of their loved one, which may be the last time for survivors to see and touch the deceased.

After final good-byes, postmortem care begins. This phase includes bathing the patient, organ procurement, and other actions according to hospital or agency policy and procedure. A short debriefing for survivors,

including examination of the nurse's own reactions, can help ease the psychological and spiritual stress encountered while caring for a dying loved one or patient. This step rarely happens but could provide great comfort and care for caregivers, many of whom have extended themselves during their loved one's terminal illness.

Chapter Summary

This chapter focused on nurses' response to critical patient situations, including changing patient conditions, pain management, and end-of-life care. In the next chapter, we present issues of health-care ethics, including principles, real-life experiences, and emerging areas affecting the nursing profession. Those areas include genomics, go-green initiatives, nanotechnologies (electronic devices), and more stringent rules and regulations governing health-care delivery, such as the Health Insurance Portability and Accountability Act (HIPAA).

CHAPTER 9

Ethics: Addressing Dilemmas in Professional Practice

To fulfill the promise of the art and science of professional nursing, an ethical framework is required. This chapter acknowledges the value of comprehensive ethical codes and emphasizes the themes of professional pride, competence, and reflective practice. Finally, it presents two content areas that have major relevance for professional nursing: genomics and "green" (ecological) initiatives.

Ethical Principles

Comprehensive ethical codes derive from ethical principles. Although some principles receive more or less emphasis in nursing programs, the following principles are important in health-care delivery:

- **Beneficence (and nonmaleficence):** Do good, and avoid evil.
- **Common good:** Respect persons, social welfare, and peace and security.
- **Distributive justice:** Grant equitable access to the basic health care necessary for living a fully human life.
- **Human dignity:** Honor the intrinsic worth of every human being, which is the basis for human rights.
- **Informed consent:** Provide the right and responsibility of every competent individual to advance his or her own welfare, exercised freely and voluntarily by consenting or refusing consent to recommended medical procedures, based on a sufficient knowledge of the benefits, burdens, and risks involved.

- **Integrity and totality:** Consider the well-being of the whole person in decisions about any therapeutic intervention or use of technology.
- **Proportionate and disproportionate means:** Fulfill the obligation to preserve life by making use of ordinary means without obligation for use of extraordinary means.
- **Religious freedom:** Grant competent individuals the right to act in a manner consistent with their religious beliefs.
- **Respect for autonomy:** Acknowledge individuals' capacity for self-determination and their right to make choices and take action based on their values and belief system.
- **Respect for persons:** Treat individuals as free and responsible persons in proportion to their ability in the circumstances at hand.
- **Stewardship:** Appreciate the Earth, with all its natural resources, and human nature, with its bio-psycho-social and spiritual capacities.

Ethical principles do not exist in isolation. The feature below describes one situation where competing principles required advocacy, scrutiny, application, and honor.

CLINICAL VOICE: WHEN ETHICAL PRINCIPLES CLASH

Mrs. Edgar, a 47-year-old wife, mother, and teacher, was a patient in the intensive care unit because of significant blood loss from a surgical procedure. She had declared her religious affiliation as a Jehovah's Witness and refused blood transfusions. She stated she would rather die. Two days later, she required mechanical ventilation to support her oxygen needs and could not speak. She was able to answer yes and no and write short messages. She continued to affirm that she would rather die than receive blood transfusions.

Nurse Garth knew that Mrs. Edgar's condition was critical. She also believed Mrs. Edgar was competent and entitled to consideration for two ethical principles in particular: religious freedom and respect for autonomy. Nurse Garth decided to call the hospital's ethics board for support. Her advocacy resulted in a meeting of Mr. Edgar, church elders, physicians, the nurse manager, and board representatives. The conversation centered on a clash between two ethical principles: the principle of proportionate and disproportionate means and the principle of religious freedom. Mrs. Edgar's surgeon saw blood transfusion as proportionate, and Mr. Edgar and the church elders presented their faith-based directive against receiving blood and reiterated Mrs. Edgar's wishes.

CLINICAL VOICE: WHEN ETHICAL PRINCIPLES CLASH—cont'd

The surgeon presented the risks from not receiving blood and described alternative measures already in place to keep Mrs. Edgar from going into hemorrhagic shock, including rapid infusion of IV fluids. He requested insertion of an arterial line to monitor her blood pressure and facilitate laboratory draws.

When Mr. Edgar and the church elders saw blood in the arterial line during a draw for arterial blood gas interpretation, they questioned the nurse. Nurse Garth stated her sensitivity to Mrs. Edgar's religious beliefs and said she had called for their meeting with the ethics board. Then she described the purpose of the blood draw, explained that Mrs. Edgar would not receive anyone else's blood from this line, and demonstrated the flush technique, which would keep the line patent and not allow blood that had exited her body to return. Satisfied that his wife's care respected their religious beliefs, Mr. Edgar went home to sleep for the first time since his wife's surgery.

Mrs. Edgar recovered slowly and without further complications. Three weeks later Nurse Garth received a letter of appreciation from the Edgars. The next year, Nurse Garth learned of a "bloodless" surgery program that would intentionally minimize the need for blood transfusions. She successfully applied to become the program's clinical nurse educator and sensitized many more nurses to advocate for their patients' religious beliefs.

Code of Ethics for Nurses

Ethical codes facilitate thorough evaluation of dilemmas that present with enough lead time to consider multiple approaches and optimal outcomes. Nursing education in the United States steeps students in the nine provisions of the American Nurses Association *Code of Ethics*, published in 2001 after a 6-year process of review, analysis, and revision of its 1985 *Code for Nurses*. Detailed directives and interpretative statements accompany the provisions, making them foundational to the process of becoming a registered nurse. Other countries, including Canada and Australia, and several professional nursing organizations also have codes. In our view, however, these lengthy codes are too cumbersome for addressing dilemmas that occur in everyday practice. Nurses need concise guidance to make day-to-day ethical decisions.

The International Council of Nurses (ICN) offers such concise guidance in its *Code of Ethics for Nurses*. With just four elements, ICN's code is readily committed to memory and provides an accessible framework for reflective practice. Each element connects nurses to a broader focus:

- **Nurses and people**: The nurse has primary professional responsibility to people requiring nursing care.

- **Nurses and practice**: The nurse carries personal responsibility and accountability for nursing practice and for maintaining competence through lifelong learning.
- **Nurses and the profession**: The nurse assumes the major role in determining and implementing acceptable standards of clinical nursing practice, management, research, and education.
- **Nurses and coworkers**: The nurse sustains a cooperative relationship with coworkers in nursing and other fields.

The fourth point contains an explicit statement of advocacy for recipients of care: "The nurse takes appropriate action to safeguard individuals, families, and communities when their health is endangered by a coworker or any other person." "Coworker" includes other nurses; nurses value the notion of connection to one another through a commonly held, international ethical code. The margin box lists the principles of this ethical code.

PRINCIPLES IN ICN CODE

The need for nursing is universal.
Nurses promote health, prevent illness, restore health, and alleviate suffering.
Inherent in nursing is respect for human rights.
Nurses render health services to the individual, the family, and the community.
Nurses coordinate their services with those of related groups.

Ethical Considerations in Professional Nursing

Research about ethical dilemmas in nursing emerged in the 1980s and focused on nurses' personal dilemmas and moral reasoning. In the 1990s research explored broader themes for the nursing profession. A study in 1991 elicited the five most frequent ethical issues:

- Inadequate staffing patterns
- Prolonged life with heroic measures
- Inappropriate resource allocation
- Inappropriate discussion of patient cases
- Colleagues' irresponsible activity

These ethical issues persist in the explosion of expectations for nurses' expertise in numerous content areas. Whether referred to as competencies, hallmarks of excellence, or indicators, these areas feature nurse-sensitive elements that require ethical decision making in daily practice. These content areas come from the American Association of Colleges of Nursing, the National League for Nursing, Joint Commission, the Institute of Medicine, and the initiative called Quality and Safety Education for Nurses:

- Geriatrics/gerontology
- Genomics

- Global awareness
- End-of-life care
- Evidence-based practice
- Cultural humility and human diversity
- Informatics, health-care technologies, and nanotechnologies
- Emergency preparedness
- Patient safety
- Safe handling of patients
- Patient-centered care
- Interprofessional teamwork and collaboration
- Quality improvement
- Ecological/green initiatives
- Community-based practice
- Dimensional analysis for drug calculations
- High-fidelity simulation

Nurse educators, in the process of developing curricula related to these competencies, must ensure that these educational strategies are evidence-based and accessible to students with disabilities. Thanks to advances in assistive technologies, such as enhanced stethoscopes, students with visual and hearing impairments have been able to soar as nurses. Often, they bring an extra measure of determination and compassion to the profession, and they serve as role models to young patients striving to find capabilities within, or despite, disabilities.

Of these content areas, we have selected two for further exploration in this chapter due to their relative newness and explicit connection to ethical practice: genomics and ecological/green initiatives. (See Chapter 1 for a discussion of evidence-based practice, patient safety, and quality improvement. See Chapter 2 for a presentation of dimensional analysis for drug calculations. See Chapter 7 for a discussion of interprofessional teamwork, collaboration, and I-SBAR-R.)

Genomics

Genomics (pronounced juh-NO-mix) was defined by scientists in 1987 as the study of the function and interaction of all the genes in the human genome. In 2003, scientists completed the Human Genome Map. By 2006, they had described 16,127 autosomal conditions and offered 1317 genetic tests. Genomic medicine goes from a prenatal focus on a single gene mutation to an adult focus on multifactorial lifestyle diseases such as diabetes and heart disease.

The ability of nurses to understand genomics and related ethical implications comes from several sources:

- Jean F. Jenkins, PhD, RN, FAAN, of the National Human Genome Research Institute of the National Institutes of Health, and her colleague Dale Halsey Lea, a nurse and Fellow in the American Academy of Nursing (FAAN), nursing's highest honor.
- The Mayo Clinic, which holds national conferences that feature nurses working directly in genomics.
- Sigma Theta Tau's *Journal of Nursing Scholarship,* which fulfilled a 2-year commitment to "genomics for health," beginning in the second quarter of 2005 (Volume 37, Issue Number 2).
- Cincinnati Children's Hospital Medical Center, which houses the Web-based Genetics Education Program for Nurses.

Many students learned terms related to genetics that are necessary but insufficient for an expanded knowledge of genomics. The margin box defines these original terms.

FAMILIAR TERMS FROM GENETICS

Genes: the units of heredity
Genetics: the science of human biological variation as it relates to health and disease; the study of the etiology, pathogenesis, and natural history of diseases and disorders that are genetic in origin (for example, the *BRCA-1* gene is a tumor suppressor gene; associated diseases, due to a mutation, are breast cancer and ovarian cancer).
Chromosomes: separate molecules ranging from 50 to 250 million base pairs that contain the genes of a particular organism (A = adenine, T = thymine, C = cytosine, G = guanine).

A glossary of terms related to genomics follows. These terms were invented and end in *-ome* because *chromosome* was strongly associated with all things genetic.

Genomics

- All the genetic material in the chromosomes of a particular organism; all the interaction between genes and between genes and the environment
- Genomics also describes size of the genome, comparison between sequences, and comparison of gene arrangement on a chromosome between species
- The human genome contains three billion nucleotide bases

Transcriptome and transcriptomics

- Transcriptome: The RNA expressed by a cell or organ at a particular time in particular conditions (RNA molecules)
- Transcriptomics: The study of the full set of RNA encoded by the genome

Proteome and proteomics

- Proteome: The proteins expressed by a cell or organ at a particular time in specific conditions.

- Proteomics: The study of the full set of proteins encoded by a genome (for example, tissue banks are studying proteins of liver cancer, mapping them, and trying to find out what goes wrong)

Metabalome

- Metabalome: The study of metabolites active in a cell, organ, or organism at a particular time in specific conditions.

Genomics has astonishing implications for health care, especially in the areas of individualized medicine, mutations, and molecular diagnostics. Genetic testing can diagnose a disease, confirm a clinical diagnosis, provide prognostic information about the course of the disease, diagnose asymptomatic individuals, and predict risk of disease in progeny. The emerging field of pharmacogenomics, which will revolutionize information in drug handbooks, is the ability to correlate DNA variation with response to medical treatment. Benefits will include avoidance of adverse drug reactions, avoidance of drugs that are not efficacious, and choice of drugs that are efficacious. Gene therapy offers the potential of using genes to treat disease or enhance particular traits.

Genomics has dramatically altered understanding of mutations and their implications. Classes of mutations include the following:

- Point mutations (e.g., hereditary hemochromatosis [HHEMO] has few mutations, whereas cystic fibrosis transmembrane regulation [CFTR] has more than 1300 mutations throughout the gene, such as changes in conformation, which can be a bubble, bend, or bulge.)
- Large deletions, duplications, or insertions (e.g., α-thalassemia)
- Trinucleotide repeat expansions (e.g., fragile X)
- Imprinting/methylation (e.g., Prader-Willi/Angelman Syndrome)

Diagnostic tools for mutations include probes, fluorescence resonance energy transfer (FRET), melt-curves, array technologies, mutation scanning techniques, DNA sequencing, assays, methylation, and electrophoresis. In 2006, the Mayo Clinic had nine floors of laboratories; one was for inherited disorders, which performed 50,000 tests in a single year. In the future, technology for personalized medicine will include high-throughput DNA sequencing and analytes, such as DNA methylation profiling and microRNAs.

Nurses have already become more involved in ordering genetic tests and interpreting test results. Reasons for referral are receiving new scrutiny for a genetic basis or component. See the Clinical Voice for a likely scenario and ethical implications.

CLINICAL VOICE: ETHICAL CONSIDERATIONS

At his yearly physical examination, Mr. Green, 62 years old, had abnormal liver enzyme function test results. His hepatitis screen was negative. A second-tier screen revealed elevated serum ferritin: 2000 ng/mL (normal: 22–322 ng/mL).
Question: Is the elevated iron in this patient due to a defect in the *HFE* gene?
Referral: Evaluation of hereditary hemochromatosis (autosomal recessive disorder, which requires a mutation in both paired genes)
Method: Polymerase chain reaction (PCR)–based assay
Result: C282Y homozygous (two copies of the C282Y mutation identified)
Interpretation: Diagnosis confirmed
Management: Phlebotomy with annual serum transferrin saturation and serum ferritin levels
Patient education: Comprehensive assessment followed by lay-language explanations of condition and treatment
Ethical considerations: Sensitive discussion with Mr. Green, who did not want to "burden" his two adult daughters with his diagnosis. The nurse drew on Mr. Green's empathetic nature by using lay terms to explain "respect for autonomy." This ethical principle advocates giving people information and allowing them to make their own decisions. Mr. Green weighed his desire to remain a "strong and healthy father figure" against the 25% risk of recurrence in his children. He assessed the risk as significant and decided to tell his daughters. The nurse offered him sample wording: "Daughter, you have a 1 in 4 chance of having the malfunctioning genes and developing this disease. You have a 1 in 2 chance of having one abnormal gene, which would make you a carrier." Mr. Green later reported that both daughters opted for genetic testing, which showed neither one had inherited the abnormal gene. He also said he had become closer to them. They did look at him in a new light, not as sick or needy but as mortal and unselfish. His daughters took turns driving him to his phlebotomy appointments, and he cherished this time with them.

The Clinical Voice suggests the scope of challenges for nurses in the field of genomics. Nurses must inform themselves about genomics (Box 9-1), keep pace with rapid changes in the field, and learn new approaches in patient education, such as lay-language analogies and metaphors, therapeutic communication strategies about inherited conditions, and empathetic ways to share sensitive information with family members. Attending to the following recommendations will accelerate your mastery in this emerging area:

- Review ANA's genomics competencies for nursing practice.
- Learn terms—patterns: autosomal-dominant, autosomal-recessive, x-linked; new or de novo mutations; atypical inheritance:

Box 9–1 Appreciating Human Complexity

- The average gene consists of 3000 bases (the largest gene, dystrophin, has 2.4 million bases).
- There are 20,000–30,000 human genes (a recent guess from Sweden is 23,700 human genes).
- Functions of about 50% of the genes are unknown. For example, 10 genes are needed to activate vitamin B_{12}.
- The human genome is 99.9% the same in all human beings. The human genome is 99.5% the same for Cro-Magnon as for Neanderthal. One change in a gene can have dramatic phenotypic expression.
- About 2% of the genome encodes instructions for protein synthesis.
- Genes are concentrated in a random area along the genome, separated by what scientists refer to as "junk," which may mean "not understood."
- Chromosome 1 (the largest) has 2968 genes. Chromosome Y (the smallest, but which has many functions) has 231 genes.
- Repeat sequences that do not code for protein comprise about 50% of the human genome. Scientists believe repeat sequences have no direct functions but shed light on chromosome structure and dynamics. Over time, these repeat sequences reshape the genome by rearranging it, creating new genes, and reshuffling old genes.

mitochondrial inheritance, imprinting, uniparental disomy, expanding trinucleotide repeats.

- Collaborate with genetic counselors (nurses' expanded role in patients' response to genetic information).
- Assess family and medication histories, physical findings, environmental factors, and patients' related knowledge and questions.
- Rethink the importance of family history and support the U.S. Surgeon General's Family History Initiative—follow Health Insurance Portability and Accountability Act (HIPAA) rules: keep relatives' names out of permanent medical records, and obtain relatives' permission and consent according to the presenting situation; add a pedigree and genogram to the family history: determine the significance of second- and third-degree relatives, assess for red flags using GENES: G = group of congenital anomalies, E = extreme/exceptional presentation of common conditions, N = neurodevelopmental delay/degeneration, E = extreme/exceptional pathology, S = surprising laboratory values.

- Learn genetic screening tools using SCREEN: SC = some concerns ("Do you have any concerns about diseases that seem to run in the family?"); R = reproduction ("Have there been any problems with pregnancy, infertility, or birth defects in your family?"); E = early disease, death, or disability ("Have any members of your family died or become sick at an early age?"); E = ethnicity ("How do you describe your ethnicity?" or "Where were your grandparents born?"); N = nongenetic ("Are there any risk factors or nonmedical conditions that run in your family?").
- Educate patients: one patient had a clean colonoscopy, but DNA evaluation of a stool sample showed cancer cells from the esophagus. The patient thought the colonoscopy had gone all the way to the esophagus.

The use of genomic discoveries in reproductive testing and genetic enhancement lacks consensus. Nurses can increase their value as stakeholders through considering the four elements of ICN's *Code of Ethics for Nurses*, shown earlier in this chapter, and reviewing related federal policy (www.genome.gov):

- **Genetic discrimination.** Most states have laws to protect the public from genetic discrimination by insurance companies and laws to protect their citizens from genetic discrimination in the workplace. According to the federal Genetic Discrimination Fact Sheet, "Genetic discrimination occurs if people are treated unfairly because of differences in their DNA that increase their chances of getting a certain disease. For example, a health insurer might refuse to give coverage to a woman who has a DNA difference that raises her odds of getting breast cancer. Employers also could use DNA information to decide whether to hire or fire workers."
- **National action.** 1990—Americans With Disabilities Act passes and provides protection from discrimination for "genetically disabled" people; 1996—HIPAA provides some protection from discrimination but does not go far enough related to genetic information; 2000—An executive order prohibits genetic discrimination in the workplace for federal employees; 2003—U.S. Senate passes the Genetic Information Nondiscrimination Act, which protects Americans against discrimination based on their genetic information when it comes to health insurance and employment, but it does not become law; 2005—A similar Senate bill, Genetic Information Non-Discrimination Act, passes but stalls in House committees; 2008—Genetic Information

Nondiscrimination Act (GINA) passes after Congressional debate spanning 13 years. The long-awaited measure paved the way for people to take full advantage of the promise of personalized medicine without fear of discrimination.

- **Questions confronting lawmakers and insurance companies.** If no symptoms exist, why should insurance companies pay for genetic newborn screening? If genetics begins at conception, what are the impact and explanation of "pre-existing condition," especially when predisposition does not equal disease?

Genomics soon will affect every setting of health-care delivery. Your engagement in this topic can be accidental or intentional. The latter choice will not only accelerate your progression to competent nurse but

CLINICAL VOICE: ETHICAL CONSIDERATIONS

Mr. Brooks, a married father of two adopted children, had inherited cystic fibrosis (CF) from his carrier parents. CF, an autosomal-recessive disease, is relatively common and has an average survival age of about 30 years. Therefore, nurses see patients with CF in pediatric, adolescent, and adult medicine; in ambulatory and inpatient settings; and in intensive care and transplant units.

Mr. Brooks was diagnosed at age 2 years, and subsequent genetic testing revealed he had the R117H mutation on chromosome 7. Now at age 34 years, he had both an admirable amount of serenity about his disease and a profound drive to live his best life. He had seen the power of nursing to help him recover from respiratory infections over the years and readily connected with nurses to promote desired outcomes. Although he endured one to three hospitalizations a year, he counted himself lucky to be among the 15% who did not also experience digestive problems. He was well aware of living past the average survival age, and recent symptoms and diagnostic tests indicated he had end-stage CF.

As the transplant coordinator at a university hospital, Nurse Jordan was part of the team evaluating Mr. Brooks for a bilateral lung transplant. Through years of experience, the team had identified the need for explicit ethical analysis of each individual case referred for transplant. Principles of distributive justice, informed consent, integrity and totality, proportionate and disproportionate means, and respect for autonomy were central to their transplant evaluations, and a formal ethics board reviewed actual and potential clashes related to physical, financial, and emotional burdens for patients and their families.

Mr. Brooks was accepted and eventually received his bilateral lung transplant without medical complications. As he and the team addressed ethical implications in advance, he also managed potential burdens as anticipated. Although his medication regimen was daunting, Mr. Brooks returned to his family, employment, and hobbies with a much improved quality of life.

will also stand you apart from peers unfamiliar with this emerging focus. The box on page 235 shows how genomics will have implications across health-care settings. Ethical considerations must move from an afterthought to an integral part of the practice of nursing.

Ecological/Green Initiatives

The second content area of discussion in this chapter is ecological/green initiatives. As with genomics, this relatively new focus for nursing has broad ethical implications.

Stewardship has emerged as a synthesis principle of ethics due to its dual emphasis on the Earth, with all its natural resources, and human nature, with its biological, psychological, social, and spiritual capacities. Nurses in every setting, from home health to the operating room, have an opportunity to exercise stewardship, particularly to capture the momentum of "go-green" initiatives. Nurses can make a profound impact in their settings to reduce waste, conserve resources, and promote sustainability in health-care delivery and beyond. The margin box describes one recent effort.

Concern for environmental protection has recurred throughout history. For example, in the Middle East, the earliest known writings about the environment addressed contamination of air, soil, and water. In the early 13th century, King Edward I of England proclaimed a ban on the burning of sea-coal in London due to pollution from its smoke. In the United States, environmental activism has its roots in the thought of the 1830s and 1840s, made famous through the writings of Henry David Thoreau. The era of American pragmatism in the latter half of the 19th century expanded attention to the environment through efforts to preserve wilderness areas. National endeavors arose during the Industrial Revolution and catapulted in the 1950s with the recognition of smog. Rachel Carson's compelling book, *Silent Spring*, accelerated momentum in the 1970s.

PROMOTING ECOLOGICAL BEHAVIOR

Holistic nursing practice provides theoretical and ethical foundations for nursing to prosper and promote a profession learning to "think globally and care locally." This study, conducted in 2004, sought to promote ecological behavior in nurses through Community Based Action Research (CBAR). A convenient, purposive community of 10 nurses at a western, urban hospital, self-identified as "The Green Team," enacted the CBAR design. The research project selected was red bag waste minimization. Actions for the research project were identified, prioritized, evaluated, and revised. Data generated consisted of three types: contextual, experiential, and action-related. Data were organized into three categories: research process, participants, and project.

Continued

In the current era, the U.S. Resource Conservation and Recovery Act (RCRA) is the primary law governing the disposal of solid and hazardous waste. Congress passed RCRA on October 21, 1976, to address the increasing problems the nation faced from growing volumes of municipal and industrial waste. RCRA, which amended the Solid Waste Disposal Act of 1965, set national goals for:

- Protecting human health and the environment from the potential hazards of waste disposal.
- Conserving energy and natural resources.
- Reducing the amount of waste generated.
- Ensuring the management of waste in an environmentally sound manner.

Readiness for "go-green" initiatives emerged in nursing in the early 1990s. Currently, Hospitals for a Healthy Environment (H2E) is a collaborative effort among the Environmental Protection Agency, American Hospital Association, American Nurses Association, and Health Care Without Harm. This effort promotes environmentally sustainable practices and prevention of pollution in healthcare facilities. For example, nurses across the nation have initiated innovative programs to:

- Reduce the use of equipment containing the toxic chemical DEPH in neonatal intensive care units.
- Repackage hospital supplies in an environmentally conscious manner.
- Recycle mercury-filled batteries.

In 2002 the National Recycling Coalition added a fourth "R" to the motto, "Reduce-Reuse-Recycle," which receives prominent coverage on the Web site of the U.S. Environmental Protection Agency. The additional "R" stands for "Rethink." Project C.U.R.E. (Commission on Urgent Relief and Equipment) embodies one of the most outstanding efforts to "rethink" medical surplus and waste.

Project C.U.R.E. identifies, solicits, sorts, and distributes medical supplies and services according to the needs of the world. In true nursing process fashion, Project C.U.R.E. completes an on-site assessment in countries

PROMOTING ECOLOGICAL BEHAVIOR—cont'd

A team approach promoted and achieved improved changes to ecologically related nursing practices. The team developed an informed awareness of the implications of nurse-generated waste through active waste analysis. The team promoted a change in the hospital's infectious waste policy. Barriers required a revision of goals and redirected research activities.

Findings suggested that an ecological view be incorporated into nursing education. Promoting nurses' ecological behavior through action research was realized.

requesting aid and establishes partnerships with governmental agencies to prevent corruption and graft, including black market redistribution of delivered supplies. Since the first shipment to Brazil in 1987, Project C.U.R.E. has shipped cargo containers to more than 120 countries, and all shipments have reached their intended recipients.

Project C.U.R.E. has redistributed items ranging from bath basins to sterile gloves to entire heart catheterization laboratories. The need is urgent in all developing countries. For example:

- In Kenya, an area of growing HIV/AIDS infection, nurses boil used needles over a fire before reusing them.
- In Nepal, a premature newborn lies in a worn-out incubator. The machine can barely keep the baby warm.
- In Sudan, physicians lack scalpels and blades. They have resorted to using the lids of tin cans to perform surgical procedures. There is no anesthesia.

Yet, in the United States, patterns of waste are astonishing. For example, a hospital ordered 300 logo-embroidered maroon scrub sets for its nurses, in part to promote brand identification in a competitive hospital marketplace. The hospital rejected the scrub sets when the color did not match the desired branding. The manufacturer notified Project C.U.R.E. of the rejected scrub sets. Instead of ending up in a landfill, the sets were distributed by Project C.U.R.E. to a hospital in south Africa. Nurses there are proud to wear them, despite sporting the embroidered logo of a hospital in the western United States.

Nurses can make a significant contribution to Project C.U.R.E. as volunteers in its collection and sorting centers, which are located throughout the country. Nurses recognize donated supplies and correctly sort them for repackaging according to assessed needs throughout the developing world. Nurses everywhere can obtain Project C.U.R.E. collection containers for their units.

The newest trend is to upcycle. Whereas recycling makes the same product like aluminum cans over and over, upcycling increases the value of the original product. In simplest terms, upcycling is the practice of taking something that is disposable and transforming it into something of greater use and value:

- Instead of recycling newspaper, wad it up, and place it into work and sport shoes to absorb odors.
- Instead of discarding cans, decorate them as flower pots or pencil cups.

- Instead of throwing plastic bags away, add twill tape handles to make them reusable or braid them into jump ropes, rugs, and sturdy "go-green" tote bags.
- Instead of discarding worn hosiery, donate it to a sewing circle to be made into stuffed animals and puppets for pediatric units.

As a newer nurse, you may have an edge on veteran nurses, many of whom have limited exposure to green initiatives. Demonstrate your access to and investment in ecological content by organizing unit nurses to:

- Initiate a "go-green" committee and identify ways to reduce-reuse-recycle.
- Host a poster competition to "rethink" waste and conservation on your unit.
- Participate in your local community in a visible way by holding a street fair to introduce upcycling.

Then go one step further. Add your leadership skills to track all of the cutting-edge topics:

- Introduce the concept of a journal club. Digest trends, organizational white papers, and research reviews.
- Gather a couple of like-minded colleagues, and develop an in-service in one of the new content areas. Share the work and the rewards of being lifelong learners.
- Notice where you like to put your effort. Consider if a theme emerges that suggests you should head for graduate school and an advanced practice role.

Chapter Summary

This chapter focused on ethical issues in nursing practice and explored two current topics, genomics and ecological/green initiatives, and their ethical implications. The next and final chapter offers a balanced approach to self-care and career development. We explain the push for the Doctor of Nursing Practice (DNP) and emphasize benefits from participation in professional nursing organizations. We conclude with take-home messages that accelerate your transition to practicing RN through nursing excellence and professional pride.

CHAPTER 10

Next Steps: Advancing in Your Career

Our final chapter juxtaposes self-care—featuring the cornerstone principle of energy management—and career development. We emphasize motivation and mentorship and offer creative and cut-to-the-chase methods for both topics. We discuss the value of participating in professional nursing organizations and include "insider" information about how to become a member of the prestigious Sigma Theta Tau International Honor Society of Nursing (if you were not inducted during your undergraduate program).

We also explain the push for the Doctor of Nursing Practice degree and present the mandate from the American Association of Colleges of Nursing for doctoral preparation to enter future roles in advanced practice nursing. Those roles currently include clinical nurse specialists, nurse anesthetists, nurse midwives, and nurse practitioners.

We conclude with a section on promoting nursing excellence and professional pride through this maxim: *pursue excellence, not perfection*. Our fondest hope is that you will embrace the charge to become "consciously competent." We encourage you to notice where we have emphasized this concept.

Caring for Self

Self-care for nurses dates from the theoretical perspectives of "careful nursing," a system of nursing developed in 19th-century Ireland. This theory predates Florence Nightingale and influenced her notions about our metaparadigm, or overall view of nursing. See Box 10-1. Our metaparadigm

Box 10–1 Establish Your Domain Definition of Nursing

We propose that you develop a one-sentence statement about what nursing means to you. Adapt one of the following statements, or create your own:

- Nursing is stewardship of holistic human health and healing.
- Nursing is a professional approach to caring for the whole person, inside and out.
- Nursing promotes health and healing across the life span in any setting.

Whatever statement you adopt, try it out on friends and family. You may create newfound respect, especially among those who questioned your career choice out of mainstream impressions of professional nursing. These misperceptions are largely due to the invisibility or misrepresentation of nurses on television shows and lack of direct interaction with nurses in primary care.

Once you have established your "domain definition" of professional nursing, become consciously competent in your approach to practice. Notice that deliberate articulation of nursing process promotes a system akin to muscle memory. When you ritualize your daily practice, you will notice more readily successful strategies in dealing with disruptions to anticipated patterns.

consists of the foundational concepts of professional nursing, which you can recall with the mnemonic PHEN:

- *P*erson
- *H*ealth
- *E*nvironment
- *N*ursing

The Theory of Careful Nursing offers a model for contemporary nursing practice that explicitly includes self-care. The theory, which Meehan reinterpreted in 2003 from the original system of careful nursing, has 10 major concepts:

1. Disinterested love
2. Contagious calmness
3. Creation of a restorative environment
4. "Perfect" skill in fostering safety and comfort
5. Nursing interventions
6. Health education
7. Participatory-authoritative management
8. Trustworthy collaboration
9. Power derived from service
10. Nurses care for themselves

The final four concepts of this theory cluster around a theme of personal leadership, which is critical to self-care. One view of leadership is the ability to focus others on the priority of the moment. Notice when and where you have "rallied the troops" to a cause, whether in your personal life or professional endeavors. To accelerate your mastery, we encourage you to see yourself as an emerging leader in as many arenas of your life as possible. Perhaps you:

- Help friends and family members focus on a goal rather than on the numerous or daunting steps required to reach it.
- Provide the vision for a family goal, such as a vacation.
- Take the lead on admissions to your unit.
- Teach a skill or concept that puzzles others.

The Seven Motivators

If you already have explicit leadership skills, enhance them with knowledge of motivators, which have varying importance for individuals. For example, some people have a stronger need for achievement than for power. Motivators play a role especially during instruction, whether of patients or colleagues. Seven key motivators are:

1. Need for achievement: people want to succeed. Meet and accept colleagues and patients wherever they are, and help them move forward. Ask: What adaptations are needed?
2. Need for power: people want to make decisions and seek a modicum of control in any situation. Offer feasible choices when they exist. Ask: Are there two or more acceptable alternatives?
3. Need for affiliation: people are social beings and seek interaction. Ask: Would a judicious amount of social interaction benefit this patient? Would my colleagues be more inclined to add current evidence to policies and procedures if we worked in teams of three instead of expecting nurses to work alone?
4. Need for autonomy: people desire a balance between freedom and interdependence and between affiliation and independence. Ask: What input is needed to discern a motivating degree of autonomy?
5. Need for self-esteem: people may feel good about themselves, but they still seek praise and recognition. More than other motivators, this one depends on your discernment and ability to deliver valid feedback. Ask: In this situation, will praise be a motivator or a disruptive roadblock to further communication?

6. Need for safety and security: as theorized in Maslow's classic hierarchy of needs, people require safety and security to pursue high productivity, achievement, satisfaction, and healing as well. Ask: Have I recognized and dealt with threats to my patients' safety and security? Have I prevented or addressed the three responses to fear: fight, flight, or freeze?
7. Need for equity: people expect fair treatment. Ask: Do I convey to patients, families, and colleagues that I am fair, just, and equal in distributing attention and privileges?

In addition to embracing a broad theoretical perspective for self-care, we offer a cut-to-the-chase method of "The Four As":

1. *A*ttitude. Dominate your thoughts with positive or neutral attitudes. Challenge any thoughts behind negative feelings, and make a consciously competent effort to move negativity toward neutrality. Although it may be unrealistic or even undesirable to move negativity to positivity, especially around issues of grief and loss, you do not want negativity to turn to wallowing despair. If you think you have little control over your attitude, consider how quickly it would change if someone you wanted to impress walked into the room.
2. *A*ppearance. Value the instantaneous impression of a clean and polished appearance, especially when accompanied by a smile. Your appearance plays an underestimated role in nursing presence. This powerful connection with recipients of care produces "the melt," which you will recognize as a noticeable relaxation of patients and/or their family members when you enter the room, especially when continuity of care requires repeated interaction. By so appearing, you can also prevent the "meltdown" that sometimes accompanies high-demand situations.
3. *A*chievement. Strive for personally meaningful achievement and benignly neglect the "shoulds" others may try to impose on you. For example, you might say, "Thank you for caring enough to contribute your thoughts. I'll add them to the options I'm considering." When others' thoughts are unsolicited, unwarranted, or misguided, your reply can still value the givers even as you discard their opinions. In addition, authentic achievement often equates with advocacy for your recipients of care. Achievement commonly leads to the next "A," accolades.
4. *A*ccolades. Accept the thanks and praise of others. As a group, nurses tend to be humble, perhaps due to the servant-leadership

nature of the profession. Consider, however, that you build visibility for the profession when you gratefully accept the honor others seek to bestow on you. Your acceptance speech might include the words of Sir Isaac Newton: "If I have seen further it is by standing on the shoulders of giants."

We also recommend diligent attention to energy management and development of a personally meaningful framework to guide your journey through nursing and life. We explain more about these notions in the next two sections.

Energy Management

Responsive self-care also depends on the ability to manage your energy, which equates to full engagement in priorities and maintenance of focus on what is truly important. Nurses typically have additional challenges related to energy management due to patients' pressing needs, rotating shifts, limited services during night and weekend shifts, and competing demands on their time when they also are parents and/or caregivers for their own parents or other relatives. Nola Pender, a prominent nursing leader in the areas of health promotion and disease prevention, theorized six subsets of health:

1. Spiritual growth
2. Health responsibility
3. Physical activity
4. Nutrition
5. Interpersonal relationships
6. Stress management

Taken together, these six subsets represent our overall concept of energy management. To help you make consciously competent decisions in these realms, review Figure 10-1, which depicts the now classic conceptualization of "first things first," developed by business leader Stephen Covey and colleagues. The upper right quadrant represents the ideal and often prevents time wasted in other quadrants; time spent in the upper left quadrant must be limited to prevent exhaustion; the lower left quadrant is borderline due

EVIDENCE FOR PRACTICE: CONCEPTS IN THE ART OF NURSING

Nursing programs introduce "textbook concepts" associated with the art of nursing, such as caring, compassion, spirituality, advocacy, and presence. In a qualitative study published in 2008, a nurse scientist discovered the following core values, which lend credence to traditional concepts and provide evidence for a more thorough appreciation of the power and purpose of professional nursing:

Caring
Compassion
Spirituality
Community outreach
Providing comfort
Crisis intervention
Going the extra distance

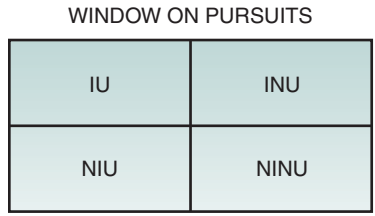

FIGURE 10-1: Covey's Quadrant Model.

to lack of importance and attention on others' priorities; and the lower right quadrant is unacceptable if it keeps you out of the upper right quadrant:

- Upper right: INU = Important, Not Urgent: such as providing anticipatory guidance to parents or doing an in-service about the value of a journal club.
- Upper left: IU = Important, Urgent: such as responding to a resuscitation effort or interpreting an arterial blood gas report for a patient having an exacerbation of chronic obstructive pulmonary disease (COPD).
- Lower left: NIU = Not Important, Urgent: such as responding to e-mails based on chronological order or shopping on impulse.
- Lower right: NINU = Not Important, Not Urgent: such as watching reruns on television or spending more time on a critic than you would on a friend.

Personal Framework

Have you ever seen a vaudeville act in which the juggler places poles into brackets on a table and then sets plates spinning on top of the poles? His skill lies in rushing back and forth to keep the plates spinning. Without constant attention and due diligence, the plates wobble and eventually fall, crashing to the floor. Many nurses relate to this metaphor when they consider the reality of their lives.

Instead of running around to spin various plates, we recommend articulating a framework based on three concentric rings. The interior-most ring is your self-designated center, or whatever is the most enduring aspect of your life. Movement outward to the next ring expresses who you are. To maintain connection to your center, author Rhonda Byrne recommends recitation of this affirmation: "I am whole, perfect, loving, strong, powerful, harmonious, and happy." We offer a preamble that honors a higher power or creator: "I am grateful, obedient, and devoted." This consciously competent approach could have any number of variations for the

affirmations selected. The important feature is the daily reminder to live purposefully and in accordance with time-honored principles.

The second concentric ring represents the micro-level of your life, which encompasses local action. You can make a difference by investing in just one other person. The effect is synergistic, the impact is exponential, and maturity follows from delayed gratification. Actions at the micro-level exemplify the principle of "sowing and reaping," which has three parts:

1. You reap what you sow.
2. You reap much more than you sow.
3. There is a period of waiting between sowing and reaping.

The accompanying Clinical Voice describes one person's effort in developing a guiding framework.

The outermost concentric ring creates the macro-level, where you think globally and with cultural humility about the sustainability of the planet's environmental infrastructure and diversity of life forms. The key to this

CLINICAL VOICE: AN EXEMPLAR AT THE MICRO-LEVEL

As a PhD-prepared community health nurse, I have a remarkable pro bono client in my private practice whom I met through a nursing student. My client, David, age 29, has lived with locked-in syndrome for 8 years, following three traumatic brain injuries. He has given permission to tell his story as he enjoys helping others directly and indirectly.

At age 19, while changing a tire on the side of the road, David was a hit-and-run victim of a drunk driver. He survived torn spinal nerves, a skull fracture, and a 1-week coma. His treatment featured a protocol at the Mayo Clinic, including nerve grafts to the c-spine and left biceps. He recovered sufficiently to return to college.

At age 20, David was mugged near his college campus, sustaining a hit to the head in the beating. He received no medical follow-up and recovered sufficiently to resume college.

At age 21, David sustained a grand-mal seizure and fall, undoubtedly connected to the two predisposing injuries. He endured another skull fracture, and this time his coma lasted 5 months. He awoke to paralysis of voluntary muscles from the neck down, loss of speech, and loss of vision in his right eye. He was treated for 6 months at a community hospital and nursing home, 4 months at a rehabilitation hospital while ventilator-dependent, 4 months at a subacute facility where he was weaned from the ventilator, 5 months at an assisted living center that found his needs too intense for staff, and 5 years and counting at a skilled nursing facility with minimal in-house services.

Continued

CLINICAL VOICE: AN EXEMPLAR AT THE MICRO-LEVEL—cont'd

David can move his head side to side and up and down and has some control of his mouth, including the ability to smile. With his vivid blue eyes, he looks up for yes and down for no and uses an alphabet system (letter-by-letter dictation until word recognition occurs) or an electronic device, with which he scans letters and phrases to post via a switch he taps with his head. With either form of communication he is precise, organized, and articulate. He can vocalize to some extent, including laughing, which is music to my ears. He gets out of bed into a non-motorized wheelchair every day via a Hoyer lift and participates in the limited rehabilitation services offered at his nursing home.

My student went to high school with David and has been a faithful visitor ever since David's diagnosis of locked-in syndrome. In fact, my student's compassion for his friend played a major role in his pursuit of a nursing degree. After tagging along on a couple of visits with my student, I asked David, "Would you like to teach your communication methods to nursing students?" He replied via the letter-by-letter method, "Let us bargain about compensation." That was when I knew he was a person full of hopes, wishes, dreams, and good humor.

I have visited David about once a week since meeting him in February 2008. With the help of our nursing student organization, we arranged visits from more nursing students and held a summer picnic in David's honor attended by 90 people. Recently, we instituted game afternoons. We take David out of the nursing home for spirited games of Uno, Apples-to-Apples, and (when in the mood to be beaten by 100 points) Scrabble. He also shines during brain teasers, like the Mensa Workout. He can answer a question from his head before I have sketched the diagram needed to visualize the problem!

From his abiding faith, David has become unwaveringly positive, grateful, and confident. He believes "incurable" means "curable from within" and is working hard to achieve renewed goals for education, career, marriage, and children. Short-term, he also expects to move from the nursing home to his own wheelchair-accessible condo with live-in help.

Through my private practice I consult with David and his devoted father to facilitate evidence-based care at his nursing home, consultations with brain scientists and rehabilitation specialists, and updated evaluations for foundation funding, an upgraded wheelchair, and a high-tech computer. New computer interfaces will increase his communication outreach via e-mail and phone and permit remote control of his environment, such as lighting and room temperature. In addition, David is pursuing an updated college degree plan, an academic scholarship, and developmental funding to complete his undergraduate degree and eventually law school. This brilliant young man is inspiring on so many levels and epitomizes the reward of a micro-level investment through professional nursing.

framework is to redirect most global thoughts to local action on the micro-level so that you do not become overextended. On the other hand, a global immersion, such as a service learning experience or other fieldwork in a developing country, typically has an exponential impact when participants have a forum in which to advertise the value of the experience.

As you consider your career path, plan a trajectory that makes sense from the following perspectives, as promoted through Campbell's Moving Mountains Self-Care Framework:

- What you love to do: if you do not know, what do you think about when you are daydreaming? Think back to your childhood. How did you spend unscheduled time?
- What you have passion for: if you do not know, what draws out indignant anger? Do you rise up against poverty, ignorance, disease, or injustice?
- What you have compassion for: if you do not know, what moves you to tears, or whose tears move you? Your compassion is a clue to the population you should serve.
- What your infrastructure or path suggests for your next step: if you do not know, chart a timeline of significant events. What have the pivotal events of your life been?
- When you live from an enduring center and express yourself through core values and deliberate action, you enhance the opportunity for clarity and deep satisfaction in your career choices. In addition, you go beyond merely balancing roles to engaging in consciously competent reflection of your most authentic self.
- In the next section, we explore future roles to consider for your career path in professional nursing. We include discussion of career development strategies via mentorship. We also explain the doctoral degree mandated for entry to advanced clinical practice, beginning in 2015.

Exploring Future Roles

We hope you remain in nursing for the balance of your career. Nursing offers a range of practice opportunities limited only by your imagination and ability to tap into resources:

- Direct patient care: acute and chronic care in a variety of settings, including hospital, home, community agency, public health agency, long-term care, and parishes.
- Entrepreneurship: inventive or creative approaches to deliver care, develop products, provide services, and offer consultation.

- Nursing education: preceptor, unit-based in-services; nurse educators in every academic setting play a vital role in the development, extension, and promotion of nursing for safe, competent patient care.
- Advanced practice roles: clinical nurse specialists, nurse anesthetists, nurse midwives, and nurse practitioners.
- Dual roles: a simultaneous path in advanced practice and nursing education; in many settings the combination offers a "work smarter, not harder" approach to maintaining currency in advanced practice roles.

Market Your Vision for Advanced Practice During Your Graduate Program

In the late 1990s a family nurse practitioner program graduated more than 20 students living beyond the metropolitan areas of a western state, including sparsely populated counties. Critics challenged the program director for graduating so many students at one time: "How will they ever find employment?"

In fact, all the students secured employment in advanced practice roles on graduation. Several of them established autonomous practices, and others joined existing family practices. These graduate students made a point of demonstrating their value in bringing health care to people where they live and sharing their vision for ways to increase a patient's "armamentarium" via targeted education in health promotion and disease prevention. Precepting nurse practitioners and physicians became their champions and provided recommendations, collaborative agreements, and/or partnerships.

Career Development

Embrace the multigenerational workforce by finding a mentor or two among long-established nurses. The best mentors are too busy to seek you out, but they enjoy working with younger or less experienced RNs. Like anyone, they are flattered by recognition and pleased when their gifts can influence others for the better. Approach potential mentors with the nursing process in mind; assess them for a good fit with your interests (Box 10-2).

Role models are powerful mentors. To that end, we provide a doctoral nurse practitioner's view of his career trajectory. Laustsen's discussion on pages 251 and 252 links core values with career development and gives you a window from which to view and compare your own trajectory.

Box 10–2 A New Take on Mentorship

Identify your needs and/or strengths for mentorship through a unique approach: review the characteristics in Gladwell's 2002 book, *The Tipping Point*:

- A maven is an "information broker" who epitomizes the "genius of the *and*" in being both a teacher and a student. A maven does not persuade but rather shares his or her own motivation to educate and help. People typically follow a maven's advice because the maven makes an emphatically convincing case. Mavens are data banks; they provide the message of the day.
- A connector knows many people and gives advice that about half the people receiving it choose to follow. A connector's importance also stems from the kind of people he or she knows. Moreover, connectors occupy multiple roles, settings, and even niches, most likely because of something intrinsic to their personality, such as confidence, social skills, or personal drive. Connectors are "social glue"; they spread the message of the day.
- A salesperson is persuasive, especially in situations where some confusion persists despite available evidence. Salespeople's powers of persuasion can be subtle, such as nodding or smiling, or more overtly charismatic. They generally exude enthusiasm, love to help, and value relationships deeply. Salespeople convince others to accept the message of the day.
- Occasionally, mentors possess two of the three traits. Rarer still is the trifecta, a person who is simultaneously a maven, a connector, and a salesperson.

Identify, pursue, treasure, and honor your mentors. They will open doors you might walk past. They will grant you favors that can eliminate months of individual effort. They will make your most authentic self want to rise higher.

Adapted from Gladwell, M. (2002). *The tipping point: How little things can make a big difference.* New York: Back Bay Books, a Division of Little, Brown & Company.

My nursing philosophy focuses on three aspects: competence, compassion, and caring. Competence is an important factor with which to address the current issue of evidence-based practice in nursing. If we are to care competently, we must be sure our interventions are efficacious and based on scientific rationale. Society expects nurses not only to care but also to be capable and competent in their actions.

Caring is synonymous with nursing. Although a domain definition of nursing remains elusive, I choose to define caring as simply the practice of the Golden Rule: Do to others as they would have you do to them. Caring is an essential facet, and our nursing mission should be to recognize the humanness in our patients and to care for the whole person.

Compassion is another necessary characteristic. Its etymology indicates its importance: com = with, and passion = boundless enthusiasm. As nurses we should be competent and caring and deliver our efforts with boundless enthusiasm. Competence without caring is dehumanizing, caring without competence is dangerous. Competent caring, without compassion, is to relegate our activities to a rote repetition of tasks.

My career goals remain consistent: to teach; to expand nursing knowledge; and to provide compassionate, competent care. As a nurse practitioner, I defend and promote my nursing perspective with the physician and nurse colleagues with whom I work. As a preceptor and educator, I plan to continue enlightening and empowering new graduate nurses.

HOW DO YOU VIEW YOUR DEDICATION TO NURSING?

Convenience
Obligation
Resolution
Devotion

Become aware of those around you who practice at lower levels. Become explicit about the need for devotion to professional nursing through consciously competent attention to patient safety, evidence-based practice, achievement of desired outcomes, and self-actualization.

Professional Nursing Organizations

An instant mentor source for your career trajectory comes from membership in professional nursing organizations. As an active member you will find:

- Potential mentors from among leaders as well as opportunities for leadership, especially when organizations have local chapters
- Cutting-edge education via organizations' periodic meetings and/or conferences as well as opportunities to apply for scholarships for your own education and research
- Association with colleagues who might otherwise have intimidated you because of their length of experience or well-developed résumés
- Opportunities for service that expand your horizons and promote fulfillment of your personal framework

You might start as a member of a committee that interests you and then watch for elections for chapter board members. Because of the Internet, many organizations value the help received from "tech-savvy" nurses regardless of their length of time in nursing. Obligations often require only a few hours a month or even a quarter. The "return on investment" can be priceless. Box 10-3 provides information on induction into Nursing's Honor Society.

Doctor of Nursing Practice

As you contemplate your future in nursing, we want you to be aware of and plan for a mandated evolution of advanced nursing practice roles.

Box 10–3 Induction Into Nursing's Honor Society

Do you have your heart set on membership in the prestigious Sigma Theta Tau International (STTI) Honor Society of Nursing? Assuming your undergraduate program has an affiliation to STTI, the main criteria to receive an invitation to join are:

- Undergraduate GPA 3.0 and higher
- Half of all program credits completed by induction date
- Top 35% of class or cohort

Many students exceed the GPA requirement, but only the top 35% receive an invitation. For some cohorts, a GPA of 3.8 or higher may be necessary. Students who miss this cut have two more opportunities for induction:

- As a graduate student: if (more likely, when) you go to graduate school, all students with a graduate GPA 3.5 and above are invited to join after they have completed at least one quarter of their program.
- As a community nurse leader: a current STTI member can nominate RNs with a minimum of a BSN degree and demonstrated achievements in practice, administration, publishing, and/or education (staff, student, and/or patient). Some RNs self-nominate through the international headquarters, but this approach might interfere with perceiving you as a community nurse leader. If you truly do not know a chapter member to sponsor you, contact the chair of the membership committee or even the chapter president for guidance.

Data from Sigma Theta Tau International Honor Society of Nursing, http://www.nursingsociety.org/

In October 2004 the American Association of Colleges of Nursing (AACN) endorsed a document called the *Position Statement on the Practice Doctorate in Nursing,* which called for moving the level of preparation necessary for advanced nursing from the master's degree to the doctorate level by the year 2015. The following talking points, reproduced here with AACN's permission, help explain this step forward for nursing education:

The Doctor of Nursing Practice Degree

The Need for Change in Graduate Nursing Education

- The changing demands of the nation's complex health care environment require that nurses serving in specialty positions have the highest level of scientific knowledge and practice expertise possible. Research from Drs. Linda Aiken, Carole Estabrooks, and others have established a clear link between higher levels of nursing education and better patient outcomes.

- Key factors building momentum for change in nursing education at the graduate level include the rapid expansion of knowledge underlying practice; increased complexity of patient care; national concerns about the quality of care and patient safety; shortages of nursing personnel, which demands a higher level of preparation for leaders who can design and assess care; shortages of doctorally prepared nursing faculty; and increasing educational expectations for the preparation of other health professionals.
- The Institute of Medicine, Joint Commission, and other authorities have called for reconceptualizing health professions education to meet the needs of the health care delivery system. Nursing is answering that call by moving to prepare APNs for evolving practice.
- In a 2005 report titled *Advancing the Nation's Health Needs: NIH Research Training Programs*, the National Academy of Sciences called for nursing to develop a non-research clinical doctorate to prepare expert practitioners who can also serve as clinical faculty. AACN's work to advance the DNP is consistent with this call to action.
- Nursing is moving in the direction of other health professions in the transition to the DNP. Medicine (MD), Dentistry (DDS), Pharmacy (PharmD), Psychology (PsyD), Physical Therapy (DPT), and Audiology (AudD) all offer practice doctorates.

Impact on Nursing Education and Practice

- Currently, advanced practice nurses—including Nurse Practitioners, Clinical Nurse Specialists, Certified Nurse Midwives, and Certified Registered Nurse Anesthetists—are typically prepared in master's degree programs, some of which carry a credit load equivalent to doctoral degrees in the other health professions.
- DNP curricula build on current master's programs by providing education in evidence-based practice, quality improvement, and systems thinking among other key areas.
- Transitioning to the DNP will not alter the current scope of practice for APNs. State Nurse Practice Acts describe the scope of practice allowed, which differ from state to state. These requirements likely would remain unchanged. The transition to the DNP will better prepare APNs for their current roles given the calls for new models of education and the growing complexity of health care.

- The DNP is designed for nurses seeking a terminal degree in nursing practice and offers an alternative to research-focused doctoral programs. DNP-prepared nurses will be well-equipped to fully implement the science developed by nurse researchers prepared in PhD and other research-focused nursing doctorates.
- The title of Doctor is common to many disciplines and is not the domain of any one health profession. Many APNs currently hold doctoral degrees and are addressed as doctor, which is similar to how clinical psychologists, dentists, podiatrists, and other experts are addressed. Like other providers, DNPs would be expected to display their credentials to insure that patients understand their preparation as a nursing provider.
- Nursing and medicine are distinct health disciplines that prepare clinicians to assume different roles and meet different practice expectations. DNP programs will prepare nurses for the highest level of nursing practice.

Continuing the Push for Nursing Excellence

The primary power of nursing lies in nurses' stewardship of holistic human health and healing. This comprehensive capability begs a relational journey with recipients of care to determine what constitutes "holistic" for individuals, families, groups, and communities. The pursuit of holism brings astonishing access to those recipients from birth to death. This broad spectrum of care across the life span demands that nurses bring an "armamentarium" or full array of health-promoting options to every care situation.

A Metaphor for Nursing

One way to capture the depth and breadth of nursing is to reflect on the metaphor shown in Figures 10-2 and 10-3. Figure 10-2 shows a glass with liquid at the halfway point. A familiar question is, "How would you describe this image?" Answers usually include:

- The glass is half full, which is an optimistic appraisal.
- The glass is half empty, which is a pessimistic appraisal.
- The glass is too big for its contents, which is a pragmatic response.

As a metaphor for the nursing profession, the ideal answer is, "The glass is full"...of potential! Nurses have the power to illuminate "potential" as they journey with patients walking every path of life, living with every health and illness state, or dying from acute or chronic conditions.

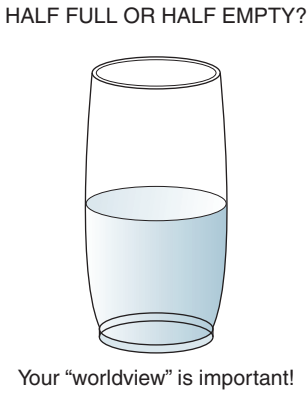

FIGURE 10-2: A metaphor for professional nursing.

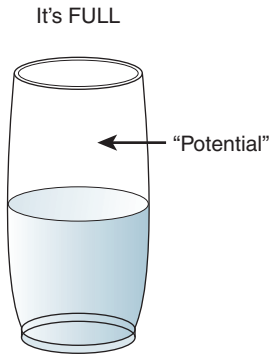

FIGURE 10-3: Completing the metaphor for professional nursing.

Just as powerful, nurses also take a sacred journey, the most poignant ones accompanying a patient's premature death. Typically, the nurse is the privileged lifeline for overwhelmed and grieving family members and sometimes groups or communities. Consider your patients' needs in the context of Covey's list of four needs:

- To live: the young man recovering from devastating injuries sustained in a hit-and-run accident
- To love: the young mother giving birth to healthy twins
- To learn: the middle-aged man with metabolic syndrome
- To leave a legacy: the older woman who has received a diagnosis of lung cancer with widespread metastasis

In the final section below, we offer five "pearls of wisdom." These pearls constitute the advice our students have told us benefited them the most, often years later.

Pearls of Wisdom

- Work smarter, not harder: look for a win-win outcome as often as possible. For example, if your unit requires multiple certifications from you, such as Advanced Cardiac Life Support, Trauma Nurse Core Curriculum, and Pediatric Advanced Life Support, pursue them as close together in your first year of practice as you can. Content from one course reinforces and sometimes duplicates content from another course. You also will command greater respect as an RN when you can document or validate your expanding knowledge base.
- Compile a repertoire that helps define you. Select favorite quotations, principles, and resources as you progress in your career. Develop a personal motto. Track the writings of two or three inspirational nursing leaders. Attend presentations whenever possible for greater personal impact. A few words of encouragement from a nursing leader can be life-changing. Type your conference notes, and review them from time to time. Share persistently resonating themes with your nursing network. Be friendly!
- Develop a council of advisors, and rotate members according to their ability not only to bring clarity to an issue but also to help you find *your* voice. When you have a big decision to make, consult with at least five others until your viewpoint becomes clear. Many newer RNs make hasty decisions in the first couple of years of practice, including abandoning their nursing career, because they neglect to obtain these clarifying perspectives.
- Go where you are valued. People often have a stubborn attachment to an unconscious or unexamined notion. We have seen former students tolerate the intolerable out of misguided loyalty, insufficient information about mobility within professional nursing, or underestimation of their own abilities.
- Adopt Ruiz's articulation of "The Four Agreements": be impeccable with your word, do not take anything personally (because both praise and criticism say more about the giver than the recipient), do not make assumptions, and always do your best. Increase your personal accountability: cheerfully meet expectations you willingly agreed to or allowed.

As you sense you have become consciously competent, stretch more and more. Consider how you can become consciously capable. Identify the resources needed for daily excellence. Persevere until you can say with professional pride, "Mission accomplished!"

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